SEPTEMBER, 1957

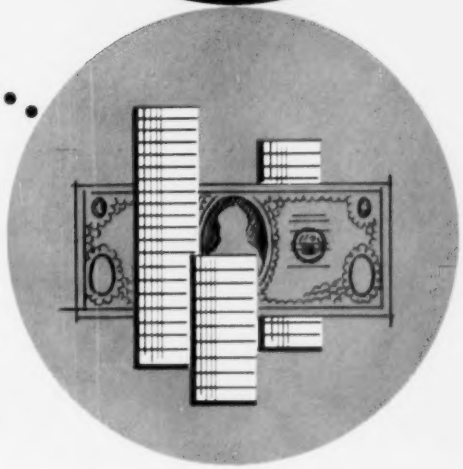
# American Engineer

## IN THIS ISSUE . . .

***A Review of the New Report:***

**Career Satisfactions of Professional Engineers in Industry**

**The Latest Professional Engineers Conference Board for Industry's Survey Reveals the Findings of Hundreds of "Depth" Interviews . . .**

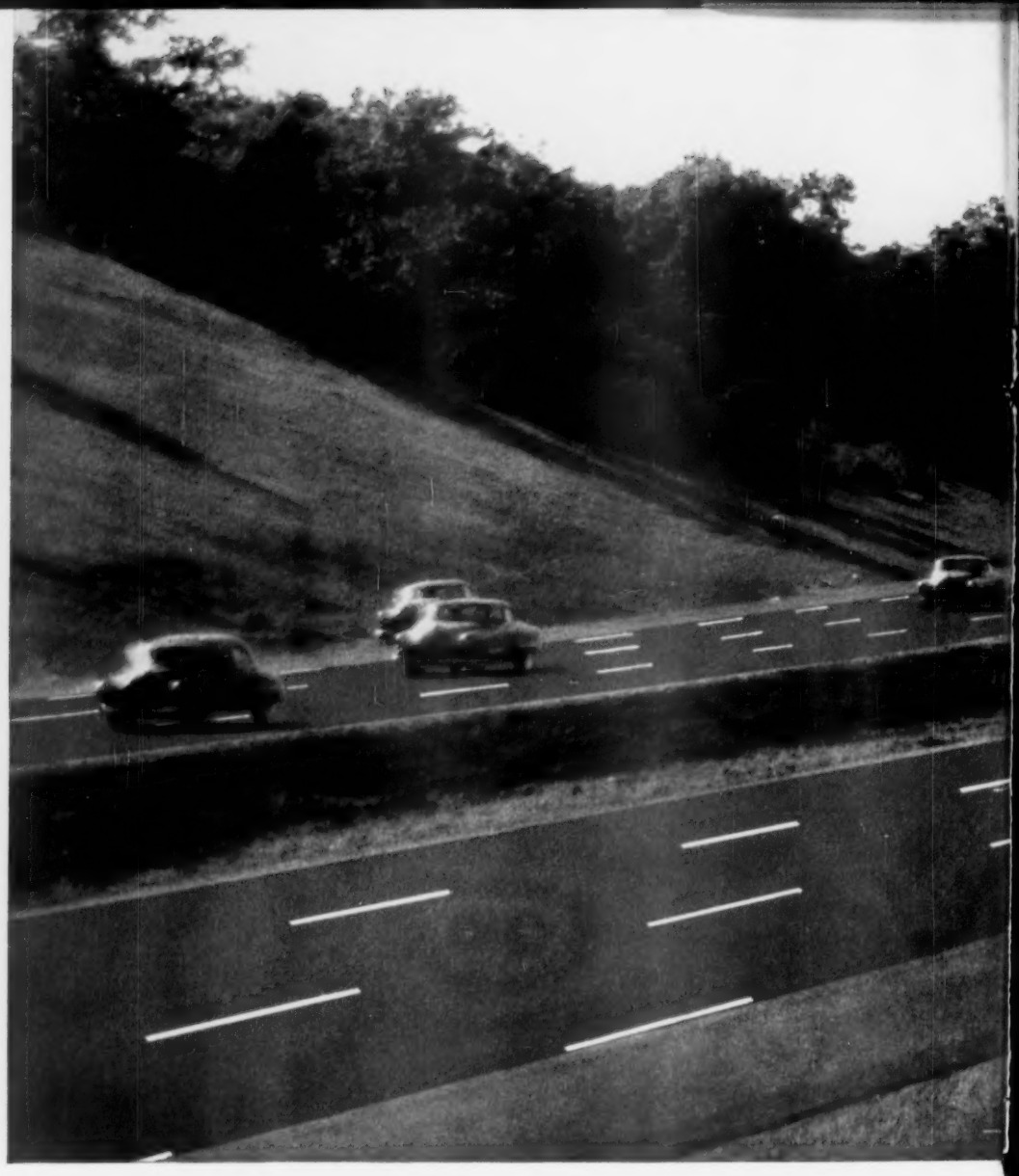


**An Engineer Versus War** by Howard G. Kurtz, Jr.

**From Engineer to Manufacturer** by Theodore W. Van Zelst, P. E.

*Plus:* News of the Fall Board Meeting in Bismarck, N. D.

EUGENE B POWER
UNIVERSITY MICROFILMS
313 NORTH FIRST ST
ANN ARBOR MICH
COMP T 71555



The new Asphalt constructed Route 128, near Boston, replaces the old route built 25 years ago. The highway consists of two roadways each of which has three 13' lanes and a 10' shoulder. Roadways are separated by a depressed grassed median varying from 30' to ¼ of a mile. The pavement consists of 12" well-compacted gravel sub-base, 4½" penetration macadam base, 1¼" Asphaltic concrete binder course and a 1¼" Asphaltic concrete surface course.

# Old road that gave traffic "the creeps"

## . . . built with high economy . . . for low maintenance . . .

Outmoded road conditions slowed traffic to a creep on the old Route 128, in Massachusetts.

So a new, wider Route 128 was recently completed . . . for today's and *tomorrow's traffic*. With greater capacities . . . better layout, grades and crossing eliminations.

It's a smooth-driving, long-lasting Asphaltic concrete highway. Built at low cost. To make cars and trucks glide along, safely. And to be easy on taxes . . . for generations to come.

Modern heavy-duty Asphalt construction has proved to be ideal for highways and primary roads in every section of the country. It allows unusual design versatility . . . speed and ease of construction.

Asphalt pavement is resilient, rugged, skid-resistant. Glare-absorbent. It seals out damaging moisture . . . is not affected by de-icing salts that usually damage other pavement. Snow and ice melt faster, too. The way ahead is clear, quicker.

In the face of rising construction costs you can keep within budgets by paving with Asphalt.

You'll keep costs down . . . keep performance high . . . keep taxpayers happier . . . when you design for modern Asphalt construction.

# replaced with wide, durable Asphalt Highway

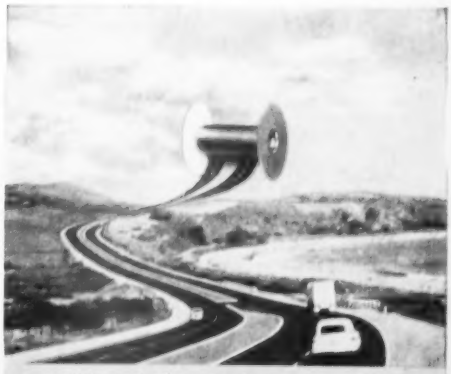
## and low future taxes

**PREFERS Asphalt Construction**

One of the companies that played a leading role in the building of the new Route 128 is the M. De Matteo Construction Company, Quincy, Mass.

The Superintendent of this company, engineer Roland S. Delaware, writes, "I have worked with Asphaltic pavements since 1931, and have always advocated the use of Asphalt in preference to other types of pavement. I like it from an engineering standpoint... and enjoy the riding qualities and speed of construction."

**THE ASPHALT INSTITUTE**
Asphalt Institute Building
College Park, Maryland



Ribbons of velvet smoothness . . .
MODERN **ASPHALT** HIGHWAYS

*(Circle 1 on Inside Back Cover)*

*what do engineers earn?*

# PROFESSIONAL ENGINEERS INCOME & SALARY SURVEY–1956

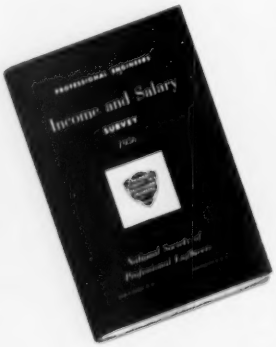
Here is the latest in a continuing series of Income and Salary Surveys of the engineering profession made by the National Society of Professional Engineers. Started in 1952, the Surveys are part of a long-range income and salary study program. This third biennial Survey presents up-to-date information gathered from engineers throughout the country, in all the engineering fields. The Survey gives a detailed picture of engineer earnings by year of entry into the profession, by geographical region, by type of employer, by engineering specialty—and by a variety of other categories. Salary and income data from more than 17,000 registered, professional engineers were studied for this newest Survey report. Published in handy booklet form, the Survey provides a documented study at all levels of professional experience. Comparative earning figures from the 1952 and 1954 Surveys make it possible to evaluate broad engineering income and salary trends for the period 1952-56. A vital research study for engineers, industrial executives, personnel officers, and all others who want the facts on engineer earnings.

**GET SOUND STATISTICAL ANSWERS TO THESE QUESTIONS**

- Which of the major engineering specialties has the highest median earnings?
- In what fields have professional engineers achieved the largest gains in total earnings over the period 1952-56?
- How do engineering salaries compare in the fields of education, public utilities, industry, government and private practice?
- How much, percentagewise, have engineer earnings increased throughout the country during the period 1952-56?

*This latest Professional Engineers Income and Salary Survey is a publication that belongs in every engineering library. It will answer the questions above, along with many others regarding engineer earnings. Use the order blank below to order your copy now.*

## *charts • tables • graphs • textual analysis*




**Price:**
**$1 per copy**

**NSPE Members: 50c**

**NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS**
**2029 K St., N. W.**
**Washington 6, D. C.**

Ship immediately ..... cop. ..... of Professional Engineers Income & Salary Survey—1956.

I enclose (check) (money order) in the amount of $..... Ship to: (please print):

Name .....

Street .....

City ..... Postal Zone ..... State .....

(Make checks payable to National Society of Professional Engineers)
$1 Per Copy
NSPE Members: 50c

☐ Check if you are a member of NSPE.

# American Engineer

SEPTEMBER

1957



Kenneth E. Trombley, Editor

John T. Kane, Assistant to the Editor

Paul E. Reece, Staff Writer and Production Assistant

•

NSPE Publications Committee
C. Arnold Dutton, P.E., Chairman
Norman S. Bosworth, P.E.
Frank W. Myers, P.E.
Gordon E. Bodien, P.E.
G. Ross Henninger, P.E.

NSPE Officers

Garvin H. Dyer, P. E., Pres.
Missouri Water Company
123 West Kansas Street
Independence, Mo.

Allan H. Kidder, P. E., Vice Pres.
Philadelphia Electric Company
1000 Chestnut Street
Philadelphia 5, Pa.

John B. McGaughy, P. E., Vice Pres.
220 West Freemason Street
Norfolk, Va.

Lindley R. Durkee, P. E., Vice Pres.
448 Federal Office Bldg.
Seattle 4, Wash.

Harry G. Kennedy, P. E., Vice Pres.
1307 Kanawha Valley Bldg.
Charleston 1, W. Va.

W. L. Hindermann, P. E., Vice Pres.
1512 West California Ave.
St. Paul 13, Minn.

Clark A. Dunn, P. E., Vice Pres.
Oklahoma A&M College
Stillwater, Okla.

R. J. Rhinehart, P. E., Past Pres.
Arkansas Power & Light Company
Pine Bluffs, Ark.

Russell B. Allen, P. E., Treas.
4610 Hartwick Road
College Park, Md.

Paul H. Robbins, P. E., Ex. Dir.
2029 K Street, N.W.
Washington 6, D. C.


•

*We need to cultivate fertility of thought as we have cultivated efficiency of administration.*

*—Norbert Weiner*

•


BPA

Member, Business Publications Audit


## SPECIAL ARTICLES


Career Satisfactions of Professional Engineers in Industry 13

An Engineer Versus War 18
by Howard G. Kurtz, Jr., Senior Associate, Handy Associates

From Engineer to Manufacturer 22
by Theodore W. Van Zelst, P.E., President, Soiltest, Incorporated

A Symposium: Professional Development of the Young Engineer in Government 30

Engineering Education Discussion Slated for Fall Meeting, Oct. 17-19 28

Nation's Leading Engineers to Sponsor Engineers' Week 31


## REGULAR FEATURES


Letters 6
Professional News Briefs 8
Engineering Employment Practices Digest 21
From Washington 25
NSPE Believes 34
With Our Members 35
With The Auxiliaries 35
Strictly Business 44

Professional Directory 36, 37, 38, 39, 40
New Literature 46
Advertisers' Index 49
Classified 49
What's New—New Products of Interest 50



ADVERTISING INFORMATION

American Engineer, 2029 K St., N.W., Washington 6, D. C.
Telephone: FEderal 7-2211

NEW YORK:
Austin LeStrange Co., Inc.
420 Lexington Avenue
New York 17, N. Y.
MUrray Hill 5-3277

CHICAGO:
LeStrange Co., Inc.
185 North Wabash Ave.
Chicago 1, Illinois
DEarborn 2-0248

LOS ANGELES:
Houston & Walsh
111 No. La Cienega Blvd.
Beverly Hills, Calif.
OLeander 5-8326



**The American Engineer is published monthly by the National Society of Professional Engineers, 2029 K St., N.W., Washington 6, D. C. Entered as Second Class Matter at the Post Office Washington, D. C., under act of March 3, 1879.** **Copyright, 1957, by the National Society of Professional Engineers.** **Not responsible for opinions expressed in signed articles. Subscription Rates: $2 per year in advance to members of NSPE and its Affiliated Societies; $3 per year in advance to non-members in U. S. A. and its possessions, Canada and Mexico. Foreign, $4 per year. Single Copy, 35c. Vol. 27, No. 9.**

# Letters to the Editor

### Leaderless P.E.'s? . . .

Dear Editor:

In the July issue Paul H. Robbins in "N.S.P.E. Believes" quite ably expressed the lukewarm state of engineering professionalism and concludes, "and lastly and perhaps most important of all, he should approach his life's career with a firm recognition that the profession owes him not one thing; that it is an honor to be accepted into the profession and that he is duty bound to earn that honor."

The profession to me is the men in it and from the leaders and eldest in it I think the younger have a right to expect leadership. Leadership means sacrifices and profound insight into the problems of the group led. If the profession is groping about, what's wrong with the leadership? Mouthing over and over again ancient platitudes which worked in days gone by is like handing out beeswax for our bowstrings; we are not fighting with bows any more.

Engineering is not like medicine and law and the clergy, which formed before the industrial revolution. Engineering is the motive force of the modern world and nine-tenths of the wealth gushes forth from its devices.

Engineering is a leaderless, formless monstrosity without knowledge of its function or its power. It is no doubt, easy to slide along and fill pages with pleasant words but that is not leadership. It is unpopular to question accepted comfortable beliefs, to tell men their thinking is sloppy, to say "no" to powerful pressure groups, but engineering will not be a profession until it knows itself. We must think through and question many accepted but inapplicable platitudes.

Let's get on with it and have some fresh original thinking so we can get out of these self-imposed doldrums.

FRANCIS G. YATES, P.E.,
Colorado Springs, Colo.

### Not U.S. $$$! . . .

Dear Editor:

On page twelve of the August issue of the AMERICAN ENGINEER you show a picture of the Pontchartrain Bridge, officially known as the Greater New Orleans Expressway, the longest bridge in the world. Underneath this picture you state, "Huge sums of Federal money are spent on such projects as roads and bridges."

In order that there may be no misunderstanding, this project was built by the joint operation of the Parishes of St. Tammany and Jefferson, Louisiana, and with the complete cooperation of the Louisiana Highways Department. Bonds were sold by the two Parishes based upon tolls and a portion of Road Fund No. 2 which is a fund created by the sale of registration plates of the Parishes surrounding Lake Pontchartrain.

Rather than being another raid on the Treasury in Washington, this project shows what the home-town boys can really do when they decide that they have the energy and ability to do it themselves.

WAYNE F. PALMER, P.E.,
Mobile, Ala.

### Good News . . .

Dear Editor:

You have brought out in nearly every issue of the AMERICAN ENGINEER which I have seen, the fact that the engineer has much to be concerned with in addition to technical problems and their solutions.

In the August, 1957, issue, I feel that you have two of the best articles stressing the importance of human concern, ethical practice, and religious factors that should and do influence engineering work as well as any other work dedicated to the service of mankind. I refer to Dean Freund's article entitled "A Logical Alliance—Engineering and Religion," and to Mr. Kauffeld's article entitled "The Engineer and His Profession —Then and Now."

The authors and the staff of the AMERICAN ENGINEER are to be commended for such high caliber articles as these.

MICHAEL W. WASELL, P.E.,
Winston-Salem, N. C.

### That "Shortage" . . .

Dear Editor:

Some of the questions raised by Mr. F. Gordon Yates, P.E., in the "Letters to the Editor" section of the June issue of the AMERICAN ENGINEER are certainly very timely and thought provoking.

Such questions as "Why are our dues spent to implement management's chant about engineer 'shortages?' and 'Why take up management's cry for more engineers which they are so obviously reluctant to pay the engineers they have?" are logical questions, and should not be evaded by NSPE. This is especially true in view of the fact that two noted economists, Dr. David M. Blank and Dr. George J. Stigler quote abundant statistics and other evidence in their recent study titled "The Demand and Supply of Scientific Personnel" that disprove the "popular" notion that there is a shortage of engineers.

These questions, and other similar questions, are often asked by potential NSPE members, and I feel that our inability to satisfactorially answer them is seriously impeding our efforts to obtain new members.

I feel that we are entitled to an answer through deeds, not just words.

CARL L. JAMES, P.E.,
Dayton, Ohio

### Two Heads? . . .

Dear Editor:

Anent the letter on billboards along highways, in your August issue:

My! My! We mustn't have billboards along our highways because we might look at them and that might be dangerous. But at the same time we mustn't have billboards because they prevent us from looking at the scenery. If looking at something is dangerous, how come we should be encouraged to look at the scenery?

HAROLD N. CAREY, P.E.,
Phoenix, Ariz.

### On Billboards . . .

Dear Editor:

In the August issue an anonymous reader, referring to Mr. Tallamy's article in opposition to highway billboards says, "If Mr. Tallamy was convinced as to the unsafe nature of billboards . . . why did he not come out and say so—forcefully and emphatically?"

To this I would say: If Mr. Tallamy's critic believes this so "forcefully and emphatically", why doesn't he sign his name and lend his prestige to this worthwhile cause?

I, too, believe we would be better off without these billboards and I think the best way to encourage such public spirited legislation is to endorse the sponsor(s). I implement this belief by regularly writing the legislators, both State and National, who introduce such legislation.

As with this letter, I also sign my name.

RICHARD G. DEVANEY, P.E.,
Kingsport, Tenn.

DEALER DISTRIBUTOR INQUIRIES INVITED

Eliminates old fashioned, bulky tracing tables and units. Porta-Trace is ready to use in seconds! Only 1⅜" thick, it is convenient, easy to work on, and can be stored like a book when not in use. Perfect for any tracing job in drafting, layout, art, photography. And, Porta-Trace gives sufficient light to permit tracing on Bristol board! Model #1118-1, 11 x 18¼", $32.50. Available in sizes up to 24¼ x 36¼"; custom units can be built for special requirements. For complete information and price list, write today!

*Registered trademark of Rohm and Haas Co.

**PORTA-TRACE, INC.**

340 CLINTON ST. BINGHAMTON, N. Y.

*(Circle 2 on Inside Back Cover)*

# Utah Vetoes Lay Licensing Board Members

A proposal to add lay members to professional licensing boards in Utah has been defeated, following a coordinated attack on the proposed innovation by the various affected professions.

The Utah Legislative Council had suggested the change on the ground that licensing of trades, occupations and professions is often handled on the basis of the interest of the regulated group rather than the public interest. The Council had also recommended the establishment of a superior over-all body to act as the final authority in the licensing of all groups and as a board of appeals. This provision was also defeated.

The Utah Engineering Council led the attack against the proposals on behalf of the engineering organizations in the State, and was joined by representatives of architects, accountants, nurses, surveyors, doctors, and others through the organization of a Utah Professional Council. The overall group represented more than 10,000 professional practitioners in the State. The professional council's arguments against the proposals pointed out that the professions subscribe to codes of ethics and require high professional standards. The amendments would weaken the protection of the public, it was stated, and would endanger present requirements limiting admission to practice to those of demonstrated qualification.

In determining the need for regulatory legislation the legislative policy of the State will be guided by a new law which provides:

"The right to engage in any lawful possession, trade or occupation is an inherent right and such right shall not be impaired through State regulation unless the interests of the people of the State generally, as distinguished from those of a particular class, require such regulation and State regulation is the most effective and equitable means of providing the necessary protection to the people of the State. It is further declared that the relative degree of hazard to the public health, safety or welfare which may result from an unregulated profession, trade or occupation shall be supported by adequate experience and research."

## SEPTEMBER MEETINGS Of Note

**American Institute of Electrical Engineers**—National Petroleum Conference, September 9-13, Sheraton Hotel, Philadelphia, Pennsylvania.

**American Society of Mechanical Engineers**—Fall Meeting, September 23-25, Statler Hotel, Hartford, Connecticut.

**Standards Engineers Society**—Annual Meeting, September 23-25, Hotel Commodore, New York City.

**Producers' Council, Inc.**—Annual Convention and Chapter Presidents' Conference—September 25-27, Brown Hotel, Louisville, Kentucky.


ACCURATE LABORATORY OR JOB-SITE TESTING...

improves quality control
prevents over-design
lowers project costs

ON ALL CONSTRUCTION!

Engineering Test Apparatus for Soils, Construction Materials, Concrete and Asphalt ranging from single items to self-contained Mobile Laboratories are available for immediate shipment.

SOILTEST Incorporated

Eastern Office
60 East 42nd St., New York 17, N. Y.
Telephone YUkon 6-7383

4711 WEST NORTH AVENUE · CHICAGO 39, ILLINOIS, U.S.A.

*(Circle 3 On Inside Back Cover)*

# PROFESSIONAL NEWS IN CAPSULE FORM

*A Roundup of Late Events for Professional Engineers*

### *William J. Roth, Jr., New Stevens Alumni Head*

NSPE member William J. Roth, Jr., consultant-manager of the Englehard Industries, has been elected president of the Alumni Association of Stevens Institute of Technology, Hoboken, N. J., it has been announced by Harold R. Fee, secretary of the engineering college's Alumni Association.

Mr. Roth, who is a 1934 graduate of the Institute, will serve for one year. He succeeds Frederick B. Llewellyn, '22, assistant to the president at Bell Telephone Laboratories, New York City.

REVOLVATOR
GO-GETTER
The MOST COPIED
LIFT TRUCK
On The Market
EASIEST WALKIE-TRUCK TO OPERATE AND MAINTAIN EVER!
FINGER TIP CONTROLS INCLUDING DYNAMIC BRAKE TO ELIMINATE "PLUGGING" THE MOTOR GOING DOWN RAMPS, AND "ARTICULATED" CONSTRUCTION ADJUSTS TO UNEVEN FLOORS. STEERS EASILY AND WORKS IN LESS SPACE BECAUSE OF THE DUAL WHEELS & DIFFERENTIAL DRIVE!
HOW ABOUT MAINTENANCE?
SNAP THE LATCH AND LIFT OFF THE COVERS—YOU DON'T EVEN TAKE THE MOTOR OUT TO GET AT THE BRUSHES, AND THE DISK BRAKE HAS A SIMPLE SCREW ADJUSTMENT
WRITE FOR OUR FREE TRUCK INDEX OF GO-GETTER ELECTRIC AND RED GIANT HAND LIFT TRUCKS
REVOLVATOR CO.
8782 Tonnele Ave., North Bergen, N. J.

*(Circle 4 on Inside Back Cover)*


### *ASTE Announces Tool Engineering Seminars*

Of interest to tool engineers and manufacturing personnel was the recent announcement by the American Society of Tool Engineers of a new series of Tool Engineering Seminars to commence on a nation-wide basis in September. In making the announcement, Harold E. Collins, president of the 33,000-member technical society, and manager of Foreign Operations of the Hughes Tool Co., Houston, Texas, said that the tremendous success of the Ceramic Seminar which was held in Houston during ASTE's 25th annual meeting last March, resulted in numerous requests from chapters for local programming of similar seminars.

These seminars will cover timely subjects of importance to tool engineers and manufacturing personnel. An effort will be made to provide a deep penetration into the subject matter. Theory, practice and the latest information will be carefully balanced so that an understanding of the basic principals involved and a grasp of the latest available tool engineering knowledge may be attained without losing sight of the importance of practical applications.

"Now, what's this nonsense about you quitting, Ed?"

### *Engineering Deans Plan Conference at Purdue*

A conference for deans of engineering will be held at Purdue University, Lafayette, Ind., September 9-12, on new aspects and developments in engineering and science and the influence that these new developments would have upon the changing engineering education of the present day.

Attendance at the conference is by invitation and is limited strictly to deans of the accredited engineering colleges. The idea of the conference was originated by Dean George A. Hawkins of the Purdue Schools of Engineering and the program has been planned by Dean Hawkins and Associate Dean Paul Chenea. The cost of the conference, exclusive of travel and living expenses of those in attendance, will be borne by Purdue University.

### *L. F. Fontana Re-elected As President of NAAMM*

Louis F. Fontana, sales manager of the Irving Subway Grating Co., Inc., Long Island City, New York, was re-elected to serve as president of NAAMM for the year 1957-58 at the Association's 19th annual convention in San Francisco, California.

Other officers of the National Association of Architectural Metal Manufacturers elected were: Richard E. Stitt, Acorn Wire and Iron Works, Chicago, Ill., vice president; Emil M. Pollak, Illinois Bronze Works, Chicago, Ill., vice president; Donald Harkins, Nelson-Harkins Industries, Chicago, Ill., vice president; Fred O. Rippel, Rippel Architectural Metals, Chicago, Ill., vice president; Robert S. Woodbridge, Woodbridge Ornamental Iron Co., Chicago, Ill., treasurer, and Frank A. Austin, Crown Iron Works Co., Minneapolis, Minn., secretary.

### *Chicago to Host AIEE Fall General Meeting, Oct. 7-11*

Chicago will again be host to the Fall General Meeting of the American Institute of Electrical Engineers, Oct. 7-11, in the Hotel Morrison.

An outstanding technical program, consisting of more than fifty sessions devoted to latest advances and discoveries in electrical engineering and the allied arts is planned. Papers are to be presented by members of the Institute's six technical divisions: Communications, General Applications, Industry, Instrumentation, Power and Science, and Electronics. Subject matter to be covered will include nuclear reactors, telegraph systems, research, ethics, television and aural broadcasting, basic science, safety, computing devices, land transportation, power generation, transmission and distribution, system engineering, computers, mining and metal industry, radio, and the chemical industry.

Fall meetings of AIEE have been held in Chicago for several successive years, with the Chicago Section of the Institute as host.



### *MAECON Scheduled For Kansas City, Nov. 13-14*

The Kansas City Section of The Institute of Radio Engineers has, for the past eight years of its sixteen years existence, sponsored an annual technical convention. The purpose of this convention is the furtherment of technology for the Midwest area—giving these people the convenient opportunity to see new products and to observe the latest advancements in the electrical and allied fields through technical paper presentations and symposia as well as through product exhibits.

This year, the ninth convention is expected to surpass all those of the past in every phase. Realizing the importance this annual event has attained, a name has been coined for it to be representative of the area which it serves. The Kansas City Section is now announcing and introducing MAECON, IRE Mid-America Electronics Convention to be held November 13 and 14, 1957, in the Municipal Auditorium in Kansas City, Mo.—with headquarters at the Hotel Muehlebach. An attendance of over 2000 is expected to visit the 100 exhibit booths and attend the ten technical sessions which will include thirty technical paper presentations.

HALF the world is half asleep! Men who could be making *twice* their present salaries are coasting along, hoping for promotions but doing nothing to bring themselves forcefully to the attention of management.

They're *wasting* the most fruitful years of their business lives . . . throwing away thousands of dollars they may never be able to make up. And, oddly enough, they don't realize—even remotely—the tragic consequences of their failure to forge ahead while time is still on their side.

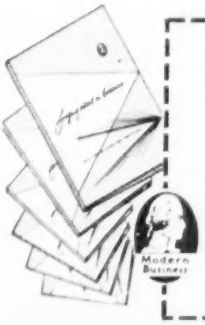
These are the men who are unknowingly headed for the frustrations and the disappointments of mediocrity. They'll go part way up the ladder and down again by the time they're fifty years old. They'll be executive material in their twenties and thirties—and clerks in their fifties. They'll have high hopes for themselves and their families while they're young; but only struggling, skimping and regret later on when their earning power should be at its height.

**Send for Your Free Copy of "Forging Ahead in Business"**

If you want to discover how to succeed while you are still young—if you want to avoid the heartbreak of failure in later years—send today for "*Forging Ahead in Business*" . . . one of the most practical and realistic booklets ever written on the problems of personal advancement.

Here you will find—not a "pep talk," not an academic lecture—but cold, hard *facts* on how to improve your position and increase your income. You will be told what the qualifications of an executive are in today's competitive market . . . what you must *know* to make $15,000, $20,000 or more a year . . . what you must *do* to accumulate this knowledge.

"Forging Ahead in Business" was written for mature, ambitious men who seriously want to get down to bed-rock in their thinking about their business future. If you feel it is meant for you, simply fill in and return the coupon below. Your complimentary copy will be mailed to you promptly.




ALEXANDER HAMILTON INSTITUTE
Dept. 563, 71 W. 23rd Street, New York 10, N. Y.
In Canada: 57 Bloor St., W., Toronto, Ontario, Canada

Please Mail Me, Without Cost, a Copy of Your 48-Page Book—
"FORGING AHEAD IN BUSINESS"

Name .....
Firm Name .....
Business Address .....
Position .....
Home Address .....

*(Circle 5 on Inside Back Cover)*

### *$187,358 Awarded By Research Corporation*

A total of $187,358 was awarded to seventy scientists in colleges and universities throughout the United States by Research Corporation during the second quarter of the year, Charles H. Schauer, director of grants, reported.

This brings the half-year total to $351,541, Mr. Schauer said.

The Boosey water level deck drain allows a swimming pool to be filled to deck level. This is more sanitary. There are no overflow gutters.

A trench surrounding the pool, drains waste, overflow, and splash. Trench is covered by slip-resistant grille. Water level is regulated by weir plates set in the pool side face of skimmer trenches.

Ladders and steps, frequently the cause of accidents, are eliminated. Swimmers and non-swimmers just roll onto the deck.

*For details, write:*

**NORMAN BOOSEY MFG., CO.**

General Sales Office

5281 AVERY AVE., DETROIT 8, MICH.

**BOOSEY**

*(Circle 6 on Inside Back Cover)*


### *Survey Show Engineers Make Good Husbands!*

Engineers make good husbands!

At least those who were graduated from Illinois Institute of Technology stay married, according to a survey of engineering graduates at the Chicago school.

No divorces were reported by three of the five classes included in the samplings of fifth year classes beginning with 1929, according to Earl C. Kubicek, Illinois Tech director of alumni relations and placement, who conducted the survey.

Returns revealed that approximately ninety per cent of the members of the classes of 1939, 1944, and 1949 were married, but that none was divorced. One divorce was reported in the class of 1929 and two per cent of the 1934 graduates were divorced.

"This is significant in view of the fact that one of every four marriages in the United States ends in divorce," Mr. Kubicek pointed out.

One of the contributing factors toward the low divorce rate, he explained, may be the relatively high level of security enjoyed by engineers.

"There has been a great demand for engineers in industry and engineering salaries have been increasing steadily for more than fifteen years," Mr. Kubicek said.

"Because they are better off financially, there may be less friction in their marriages over money problems, one of the major factors in divorce."

Mr. Kubicek sent questionnaires to 2,980 alumni—approximately ninety per cent of whom are engineering graduates. More than half of the alumni replied, which is an unusually high response for such a survey.

### *Donald H. McCoskey Retires After 28 Years*

Donald H. McCoskey, chief of the Engineering Division of the Southwestern Division, Corps of Engineer, has retired after twenty-eight years of service.

Mr. McCoskey, a member of NSPE, has accepted a position with the engineering firm of Tippetts-Abbett-McCarthy-Stratton, New York City. He will be stationed in Baghdad, Iraq, as their chief engineer in that country, where he will be responsible for the Development Board of Iraq.

### *Civil Service Commission Announces Examinations*

The U. S. Civil Service Commission has revised and reissued the announcement of the currently opened examination for engineer. This new announcement incorporates examinations for various specialized branches of engineering which were formerly publicized under separate announcements. The engineering positions to be filled are in various fields of work and pay from $4,480 to $11,610 a year. They are located in various Federal agencies in Washington, D. C., throughout the United States, and in foreign countries.

To qualify for these positions, applicants must show appropriate education or experience in engineering. A written test for certain positions is required of applicants who do not meet the requirements for a degree in engineering. Applications will be accepted from students who expect to complete the required study within nine months.

For further information, including instructions on where to send applications, consult civil service examination announcement No. 112 B. Information on examinations and application forms may be obtained from most post offices or from the U. S. Civil Service Commission, Washington 25, D. C.

### *Elect Charles H. Topping Building Institute Pres.*

Charles H. Topping, senior architectural and civil consultant for E. I. du Pont de Nemours and Company, Wilmington, Del., has been elected president of the Building Research Institute, technical society for the building industry, for the 1957-58 year, it has been announced.


**ARE YOU KEEPING PACE?**

HAS SCIENTIFIC PROGRESS MADE HOLES IN YOUR TECHNICAL BACKGROUND?

QUANTUM CHEMISTRY · ASTROPHYSICS · NUCLEAR ENERGY · MANAGEMENT

IF NOT, ISS BRINGS YOU THESE AND MANY OTHER UP-TO-DATE COURSES AT PRE-COLLEGE, COLLEGE AND POST GRADUATE LEVEL – – – THROUGH ISS HOME STUDY METHODS

Contract Instruction also arranged for Industry or other groups. Write us for details. List courses of interest and size of group.

FOR FREE INFORMATION CLIP AND MAIL TO

INSTITUTE OF SCIENTIFIC STUDIES
248 ARLINGTON AVE., ELMHURST 14, ILL.

NAME
ADDRESS
CITY–ZONE–STATE

**ISS**

*(Circle 7 on Inside Back Cover)*

### *Engineering and Management Course To Be Given at Univ. of California*

An Engineering and Management course, a two-week intensified program designed to prepare personnel for higher management responsibilities, will again be held on the Los Angeles campus of the University of California, January 27 to February 6, 1958, according to Edward P. Coleman, coordinator, whose office at the University is already accepting registration for the widely known course.

Study arrangements include a ten-day course from 8 a.m. to 5 p.m.; four 1½-hour instruction periods plus a luncheon meeting daily and approximately twenty-five different subject offerings with a daily instruction period for each subject for the full ten days. The total number of persons admitted and the number permitted to enroll in any subject will be controlled in order that each person may have maximum opportunity for participation. The course is designed to be of value to most levels of engineering and management personnel. There are no formal educational requirements.

Subjects covered during the intensive study period will include General Management Principles, Engineering and Research Administration, Managerial Adjustment to Labor Law and Union Relations, Leadership Principles, the Economics of Plant Investment and Equipment Replacement, and a laboratory in Leadership, as well as specialized work in motion study and simplification of work, work measurements and allied topics.

Information concerning course material and housing during the conference period as well as registration details, is available on request to Mr. Coleman, Engineering Extension, Room 3104, University of California, Los Angeles 24, California.

❁

### *Changes Predicted In Engineering Education By Illinois Tech President*

Far-reaching changes in the education of engineers were predicted recently by Dr. John T. Rettaliata, president of Illinois Institute of Technology.

The prospective engineering student can look forward to more emphasis on the sciences and humanities, and less attention to applications during his undergraduate days.

"Specialization will move to the graduate area," he said, and "it will not be too long before a graduate degree is the minimum requirement in engineering, as is the case in the sciences."

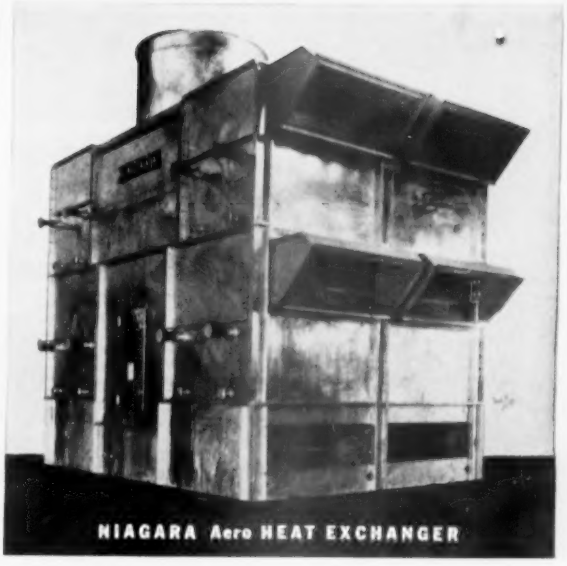
The remarks were made at the opening session of a four-week graduate engineering program sponsored by the Western Electric Company at Illinois Tech.

"The undergraduate engineering program, as now organized, does not provide the desired depth and breadth of scientific foundation and the background for creative thinking that is so essential in today's fast-moving world," Dr. Rettaliata said.

He pointed out that steps are being taken to prepare engineers who are well grounded in fundamentals and possess the ability for creative thinking.

"The effect of these modifications will be to approach unification of the various engineering disciplines at the undergraduate level," he explained.

"The majority of the program will be the same for all engineers, with those courses defining the major discipline not exceeding several semesters out of the four years."


# WATER SAVING
*with*
## TROUBLE-FREE COOLING EQUIPMENT

• Cools your jacket water for engines or process equipment or electric apparatus. Your closed system keeps free from dirt or maintenance troubles. You can cool air, gases, chemicals, plating baths, quench baths, welding machines, extrusion and drawing machines and hydraulic presses. You get real precise temperatures, save rejections, lower production costs. Use NIAGARA AERO HEAT EXCHANGER cooling with atmospheric air...saves water, pumping, piping and power; quickly saves its costs.

**Convenient Units Up To 30,000,000 BTU Capacity**

***Write for Bulletins No. 120, 124 and 132***

**NIAGARA BLOWER COMPANY**
Dept. AE-9, 405 Lexington Ave., New York 17, N. Y.
*District Engineers in Principal Cities of United States and Canada*

*(Circle 8 on Inside Back Cover)*

# *Aluminum grating now only slightly higher than conventional steel gratings*

**Borden, through many years of plant production control, can now produce aluminum floor gratings by the same commercial methods used for ordinary steel gratings. Thus the ultimate in-place cost is only slightly higher than that of conventional gratings.**

**Once installed, the floor gratings need never be painted and have all the advantages inherent to aluminum—which includes corrosion resistance, spark-proof and light weight.**

Write for complete information on BORDEN All/Weld, Pressure Locked, and Riveted Floor Gratings in this FREE 8-page catalog

**BORDEN METAL PRODUCTS CO.**

953 GREEN LANE, ELIZABETH, N. J.

SOUTHERN PLANT—LEEDS, ALA. — MAIN PLANT—UNION, N. J.

**BORDEN METAL PRODUCTS CO.**

Gentlemen:

Please send me BORDEN Catalog

NAME .....

TITLE .....

COMPANY NAME .....

ST. AND NO. .....

CITY AND STATE .....

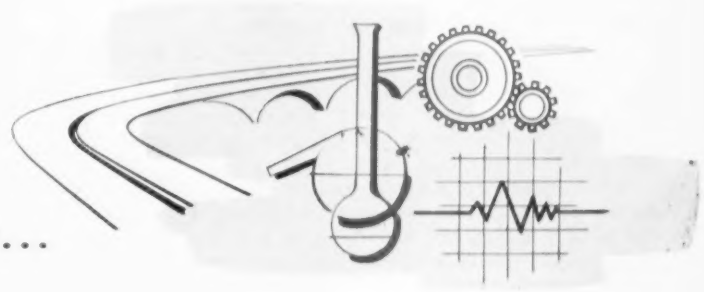
*(Circle 9 on Inside Back Cover)*

American Engineer

*The Magazine of the Registered Professional Engineer*

VOLUME TWENTY-SEVEN NUMBER NINE

***We are Pleased to Present A Review of the Latest Report of the Professional Engineers Conference Board . . .***



# Career Satisfactions of Professional Engineers in Industry

***Editor's Note: See page 17 for Information on How to Obtain the Complete Study***

## *About the Survey . . .*

THIS report presents findings based on intensive "depth" interviews with a sampling of professional engineers in industry. The purpose of the study was to examine the thinking of engineers at three different stages in their careers:

1. Early in career—3-6 years' experience
2. Midpoint in career—10-15 years' experience
3. Later career stage—20-25 years' experience

A further purpose was to determine whether or not the more successful engineers are clearly different in their thinking from the others.

Intensive, in-person interviews were conducted with 265 engineers employed by large companies by Opinion Research Corporation's field staff. The interviews were usually conducted in the home, although in some instances they were conducted at the engineer's place of employment. The engineers were assured anonymity, and they spoke frankly. The interviewers reported the respondents generally were most cooperative and expressed considerable interest in the research project.

Respondents were told that the project was being sponsored by the research unit of one of the leading professional engineering societies, without specifically identifying the Professional Engineers Conference Board for Industry. They were also advised that the survey results would be released by the sponsoring society for the use and benefit of both industry and the engineering profession. Some of the detailed question-by-question tabulations used in the analysis are included in this article.

## *The Research Plan . . .*

IN this study the objective was to obtain the views of the men who were clearly regarded as professional engineers as distinct from technicians and subprofessionals. For this reason it was decided to sample by company and obtain from participating companies the names of individuals in their employ in the different experience categories being sampled.

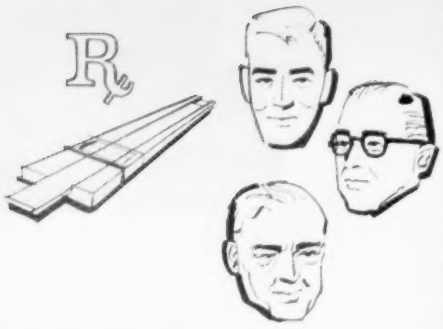
In all, eleven companies were included in the survey in the following industries: Aircraft, Automobile Manufacturing, Chemical, Electronics, Electrical Machinery, Heavy Equipment, Petroleum Refining, Rubber.

Each company is among the top 200 largest corporations in the United States and each is a major employer of engineering talent. Geographically, they are distributed from coast to coast in key industrial centers. The companies selected for participation were requested to select at random a sample of engineers and provide their names and addresses so that they might be contacted at home for an interview.

The following criteria were used for selection: respondents were required to hold engineering degrees and be employed in recognized professional engineering assignments; or, in the case of engineers with longer service, have spent a major part of their career in such assignments.

This survey, it is hoped, provides meaningful results for professional engineers in large companies. The emphasis in this study is not on quantitative results alone; an important part of the survey analysis is based on the detailed qualitative comments the engineers made in the course of the interviews often lasting well over an hour.

While the engineers interviewed were picked to eliminate any bias which might be anticipated in the study, it should be recognized that broad generalizations for industry as a whole, and possibly for segments of the engineering profession not surveyed, may not be justified.



## A Brief Review of the 90-page Report

—Engineers in industry rate the high caliber of their colleagues, the opportunity for further training, and the opportunity for advancement as the most satisfying factors in their present jobs.

These are some of the findings in the newly published survey report entitled "Career Satisfactions of Professional Engineers in Industry."

The publication is the latest in a series of executive research reports made under the sponsorship of the Professional Engineers Conference Board for Industry, in cooperation with NSPE.

Sixty-seven per cent of the engineers in the 3-to-6-years-experience group stated that there were things lacking in the college training they received, and approximately seventy-six per cent of those with more experience felt that there were deficiencies in their college training.

The engineers surveyed enthusiastically endorsed a wide range of things management can do to foster professional recognition. The engineers said management should:

Keep engineers informed

Ask for their ideas on relevant matters

Identify their names with their work

Show how their work fits into the total picture

The survey indicated that the engineers in the company hierarchy view themselves as superior to the accounting, personnel, public relations, and advertising branches. However, appreciable numbers feel that the engineer is accorded less importance than the production and sales departments. Well over half the engineers in all experience-level groups think that engineering is not recognized as a profession by the general public.

The survey found that the engineer "feels deficient in the non-technical skills, and welcomes company training

*(Continued Outside Column, page 15)*

## About the Conference Board

The Professional Engineers Conference Board for Industry composed of leading industrial executives was established to inaugurate and guide a program of research on engineer-management problems. This Board, working with officers and staff members of the National Society of Professional Engineers, screens and advises on the contents of research survey questionnaires and on the final reports which result from them.

## Facts From the Report . . .

### Which Way?

"Assuming an engineer could advance just as far in strictly engineering work as he could by moving into management, which way would you personally prefer to direct your career?"

| | 3-6 Years' Experience | 10-15 Years' Experience | 20-25 Years' Experience |
|---|---|---|---|
| Strictly engineering | 38% | 43% | 34% |
| Management | 51 | 49 | 49 |
| Qualified answers | 7 | 4 | 15 |
| No opinion | 4 | 4 | 2 |

### Career Opportunities in Company

*"In the company you now work for, is there adequate opportunity to build the kind of permanent career you want, or isn't there?"*

| | 3-6 Years' Experience | 10-15 Years' Experience | 20-25 Years' Experience |
|---|---|---|---|
| Yes, adequate opportunity | 89% | 90% | 97% |
| No, not adequate | 9 | 8 | 2 |
| No opinion | 2 | 2 | 1 |

### Engineers as Managers

"Some people say that engineers have to change their way of doing things if they want to be successful managers. Do you think there is a lot of truth in this, or is it greatly exaggerated?"

| | 3-6 Years' Experience | 10-15 Years' Experience | 20-25 Years' Experience |
|---|---|---|---|
| Lot of truth | 35% | 44% | 47% |
| Greatly exaggerated | 58 | 45 | 50 |
| No opinion | 7 | 11 | 3 |

### Advancement Outlook

"In looking to the future, have you been seriously thinking about some better job that you would like to have, either in your present company, or in another company?"

| | 3-6 Years' Experience | 10-15 Years' Experience | 20-25 Years' Experience |
|---|---|---|---|
| Yes | 76% | 70% | 62% |
| No | 20 | 28 | 36 |
| Don't know | 4 | 2 | 2 |

"Five years from now, do you think it is likely that you will be in the same job you now have or is there a good chance that you will have advanced to a better position, either in your present company or in another company?"

| | 3-6 Years' Experience | 10-15 Years' Experience | 20-25 Years' Experience |
|---|---|---|---|
| Likely in same job | 13% | 12% | 22% |
| Advanced in company | 69 | 79 | 70 |
| Advanced in another company | 11 | 2 | 2 |
| Don't know | 7 | 7 | 6 |

## *Facts From the Report . . .*

### Dissatisfaction

Factors most lacking in own job:

| | Lowest Technical | Highest Technical | Supervisory or Managerial |
|---|---|---|---|
| Clerical assistance on the routine part of your work | 50% | 40% | 30% |
| Reasonably private working quarters | 48 | 44 | 32 |
| Clear definition of authority and responsibility | 46 | 34 | 30 |
| Being recognized and treated as part of management | 35 | 20 | 15 |
| Good salary | 26 | 11 | 10 |
| Recognition of individual achievement | 24 | 14 | 11 |
| Opportunity for further training | 22 | 16 | 19 |
| Chance to do creative, challenging work | 20 | 8 | 3 |
| Chance to keep up with new developments in your field | 15 | 16 | 10 |
| Liberal employee benefits | 13 | 1 | 4 |
| Minimum of direct supervision | 13 | 4 | 4 |
| Opportunity for advancement | 11 | 7 | 3 |
| Boss or supervisor who knows his job | 7 | 6 | 4 |
| Long term job security | 4 | 5 | 1 |
| Congenial, high caliber workers | 2 | 3 | 5 |

### Professional Activity

| | Lowest Technical | Highest Technical | Supervisory or Managerial |
|---|---|---|---|
| Are registered engineers | 11% | 31% | 47% |
| More active than average in civic and community affairs | 15 | 22 | 27 |
| Are members of professional societies | 37 | 64 | 76 |
| Are very or fairly active in professional societies | 6 | 27 | 40 |
| Are members of business or civic organizations | 24 | 31 | 39 |

### Factors in the Ideal Job . . .

| | 3-6 Years' Experience | 10-15 Years' Experience | 20-25 Years' Experience |
|---|---|---|---|
| Authority & Responsibility | 15% | 40% | 34% |
| Clerical Assistance | 13 | 19 | 13 |
| Minimum of Supervision | 13 | 19 | 21 |
| Liberal Benefits | 7 | 13 | 16 |
| Private Quarters | 7 | 13 | 15 |

*(Continued from Outside Column, page 14)*

that will extend his competence beyond the purely technical."

Topping the list of company sponsored training courses that the engineers said would be most profitable to them were: organization and planning, how to supervise, and how to handle people.

The survey found that the engineer "doesn't have a very strong bent for engaging in the activities of professional societies; he doesn't see the need for such activity on his part, and doesn't view it as status building." Only ten per cent of the engineers surveyed said they are "very active" in professional engineering societies; seventeen per cent said they are "fairly active;" and the rest said they "do little or nothing in professional societies."

The survey also found that the most skepticism about the opportunities for advancement in engineering was expressed by men in the lowest technical jobs.

Six out of ten of the engineers surveyed reported that they have not held a full-time job with any company other than their present employer. Only one in five has experience with as many as two other employers.

The survey questions centered around such things as the engineer outside of his work, the career outlook of engineers, satisfaction and frustration on the job, the

*(Continued on page 16)*

### Engineer Comments About Engineering as a Career

"The major thing is the creative aspect. There is a personal satisfaction in seeing a job completed, it is a matter of pride in your own profession. I feel a strong pride in my own profession and in the results of my work."

"Basically, it is the 3 R's, they are better in engineering than in most other fields—recognition, responsibility and remuneration. There is the challenge and diversity of assignments and all the things that contribute to a satisfying job."

"Mainly, there is the feeling of accomplishment, the challenge that is offered people in our field; the advancement of civilization has been helped by science and engineering."

"I think it offers a challenge to a young man who has any spirit of adventure to pioneer into new things. In general it is a nice type of work, there is considerable variety in the work. There are higher paying and easier jobs, but there is a lot more to life than ease and high pay."

"There is satisfaction from the creative work and pioneering that goes into engineering. The pay has never been bad."

"In engineering a person can look forward to something every day. He has the opportunity for creative thinking."

"Engineering is for the welfare of mankind. It is performing a service for mankind. It is a field with lots of opportunities."

"Engineering is a dynamic profession; there are always increases in development and expansion. From personal experience I think it is one of the better professional careers."

"There is the satisfaction of creating something, developing new ideas and techniques. An engineering job leads to management and other responsible positions."

## Report

(*Continued from page 15*)

question of professional status, and the differences in values of the more successful engineers.

Eleven companies, each among the 200 largest corporations in the United States, were represented in the survey. The industries covered were: aircraft, automobile manufacturing, chemicals, electronics, electrical machinery, heavy equipment, petroleum refining, and rubber.

## *Facts From the Report . . .*

### Qualities for Success

"In your opinion, what qualities does an engineer need to rise to the top in his field?"

| | 3-6 Years' Experience | 10-15 Years' Experience | 20-25 Years' Experience |
|---|---|---|---|
| Ability to work with others; an understanding of human relations | 55% | 56% | 46% |
| Technical skill; mathematical and technical aptitude; knowledge of basic facts | 45 | 34 | 53 |
| Willingness to work; perseverance; aggressive in desire to get ahead | 36 | 42 | 44 |
| Capable of leadership; direct and supervise others | 16 | 10 | 17 |
| Skill in communication of ideas; good knowledge of written and spoken English | 9 | 21 | 25 |
| Interest in his work; curiosity to understand why and how things work | 9 | 7 | 15 |
| Good sense; able to think logically | 9 | 5 | 6 |
| Creativity; originality; imagination | 9 | 14 | 8 |
| Adaptability; open to suggestions and criticism | 7 | 6 | 3 |

(Chief mentions)

### Engineers vs. Other Groups in Company

"In the company where you work, would you say the engineering department is more highly regarded, or less highly regarded than these other groups?"

| | Engineers More Highly Regarded | Engineers Less Highly Regarded | Same, No Opinion |
|---|---|---|---|
| Accounting | 79% | 2% | 19% |
| Personnel | 66 | 6 | 28 |
| Public Relations | 53 | 8 | 39 |
| Advertising | 54 | 6 | 40 |
| Manufacturing | 39 | 22 | 39 |
| Sales | 28 | 31 | 41 |

### Treatment Engineers Consider Important

"Are each of these really important for engineers, or don't they care?"

Really important to engineers:

| | 3-6 Years' Experience | 10-15 Years' Experience | 20-25 Years' Experience |
|---|---|---|---|
| Allow engineers to keep their own time record without punching a clock? | 80% | 86% | 75% |
| Give engineers vacation and time off prerogatives similar to management personnel of equal rank? | 82 | 85 | 85 |
| Make an effort to show engineers how their work fits into the entire product or project? | 100 | 98 | 99 |
| Call on engineers to help in client contacts? | 67 | 66 | 75 |
| Have appropriate personnel policies which distinguish engineers from clerical employees? | 69 | 68 | 65 |
| Wherever practical, identify engineer's name with the projects or work he does? | 73 | 71 | 80 |
| Include engineers in management incentive plans? | 58 | 60 | 70 |
| Ask engineers to represent company in community affairs? | 35 | 43 | 42 |

### Engineers' Status in the Company

"At the place where you work are engineers recognized and treated as part of management or not?"

| | 3-6 Years' Experience | 10-15 Years' Experience | 20-25 Years' Experience |
|---|---|---|---|
| Yes, recognized | 62% | 63% | 72% |
| No, not | 31 | 30 | 25 |
| Don't know | 7 | 7 | 3 |

"In the company where you work would you say that engineers are recognized as professionals, or is there some confusion as to their professional status?"

| | | | |
|---|---|---|---|
| Yes, recognized | 56% | 61% | 69% |
| Some confusion | 38 | 29 | 28 |
| No opinion | 6 | 10 | 3 |

### Needless Detail Work

"Of the things that you do in your job, about what percentage are details and routine that you feel you shouldn't have to do?"

| | 3-6 Years' Experience | 10-15 Years' Experience | 20-25 Years' Experience |
|---|---|---|---|
| | 51% | 57% | 49% |
| 10% | 7 | 7 | 7 |
| 20% | 15 | 18 | 21 |
| 30% | 18 | 19 | 10 |
| 40% or more | 11 | 13 | 11 |

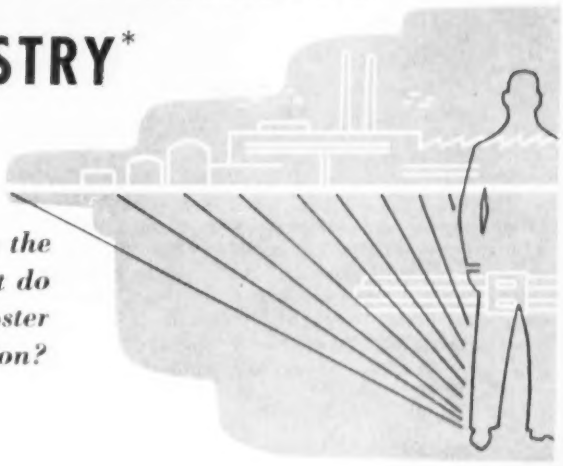
### Company Training for Engineers

"If your company sponsored training in all of the things on this list, which 3 or 4 do you feel would be most profitable to you?"

| | 3-6 Years' Experience | 10-15 Years' Experience | 20-25 Years' Experience |
|---|---|---|---|
| Organization and planning | 65% | 65% | 68% |
| How to supervise | 53 | 40 | 36 |
| How to handle people | 45 | 45 | 57 |
| Advanced engineering | 44 | 31 | 24 |
| Company economics | 38 | 35 | 30 |
| Letter and report writing | 35 | 31 | 40 |
| Public speaking | 31 | 42 | 38 |
| Advanced mathematics | 31 | 17 | 12 |
| How to conduct meetings | 15 | 22 | 33 |
| Budgeting | 5 | 19 | 14 |

*Executive Research Survey Report*

# CAREER SATISFACTIONS of PROFESSIONAL ENGINEERS IN INDUSTRY*



***What do engineers in industry rate as the most satisfying job factors? What do engineers think management can do to foster professional recognition?***

You can get specific answers to these questions and many more about engineers in industry in this latest Executive Research Survey report. Based on data gathered from lengthy "depth" interviews, the survey brings out the non-salary career satisfactions of engineers in industry at three stages of professional experience—3 to 6 years, 10 to 15 years, and 20 to 25 years. "Career Satisfactions of Professional Engineers in Industry" is an intensive study of motivation factors in a representative sampling of engineers employed in American industry. Comprehensive statistical analyses—as well as detailed comments by engineers—are given throughout the published report. Use the handy coupon below to order your copy of this valuable addition to your engineering library.

***Note These Chapter Titles:***

- **Career Outlook of Professional Engineers**
- **Satisfaction and Frustration on the Job**
- **The Question of Professional Status**
- **Are the Values of the More Successful Engineers Different from the Others?**

* Survey made by the Opinion Research Corporation, Princeton, N. J., for the Professional Engineers Conference Board for Industry, in co-operation with the National Society of Professional Engineers.

**Price:**

$1.50 to NSPE members

$3 to non-members

Other Conference Board reports:

$1 to NSPE members

$2 to non-members

**Professional Engineers Conference Board for Industry**
2029 K Street, Northwest, Washington 6, D. C.

Yes, I am enclosing check or money order for $ . for which please rush the following to me:

copies of "Career Satisfactions of Professional Engineers In Industry" at
copies of "How to Train Engineers In Industry" at
copies of "How to Attract and Hold Engineering Talent" at
copies of "How to Improve the Utilization of Engineering Manpower" at
copies of "How to Improve Engineering-Management Communications" at

Name

Firm

Address

☐ Check if you are a member of NSPE.
(Make checks payable to the Board).

*Can It Happen Again?*

# An Engineer Versus War


## By HOWARD G. KURTZ, JR.

**Senior Associate, Handy Associates, Management Consultants**


As an engineer approaches the phenomenon of war, his analysis of the problem is in two stages: (1) He attempts to list all possible "causes" suggested from all sources and (2) He further analyses these "causes" in search for tangible factors which are subject to engineering study and development.

Before proceeding further, the engineer would admit several prejudices, subject to later confirmation.

1. If there really are as many different "causes" of war as have been suggested from the many different academic approaches, the problems would be hopeless.

2. Since the observable aspects of war are so similar in every case where the phenomenon occurs, it would be assumed that it must be brought about by the same dynamics each time . . . and not by some different "cause" each time. All wars basically are similar in the same way that all frontal thunderstorms are similar . . . and brought about by similar dynamics . . . although each storm may vary in minor detail, severity, duration, location and rainfall.

3. While all the "causes" of war suggested may have validity, it can be suspected that there is a single dynamic common to them all which is the strategic factor for which we are searching. It must be a dynamic which meets two requirements:

1. It must be present in every case where war between nations occurred and —

2. War could not occur if the factor is absent.

It is just such a critical tangible factor which has been isolated.

The critical or strategic factor in the phenomenon of war makes possible rational evaluation of all the different "causes" suggested by the scientists. Each such "cause" has a provable relationship to war only to the extent that it contains the critical factor we shall isolate.

It would be necessary to try to check each suggested "cause" against every war in history to find one that is present in every case where the phenomenon occurs. One great difficulty in the way of such an engineering analysis is the resistance against giving up superstitions, phantoms and beliefs which one wants to continue to cling to. Here are two examples:

### Why this Article . . .

—This is an engineering analysis focused higher than tactics, strategy, or even national policy . . . focused on the level of the objectives of national policy, in search for universal objectives common to people of all races, colors, creeds and nationalities which can determine the national policy of more and more nations and eventually all nations.

—The strategies and tactics for obtaining these objectives are omitted.

—Crystallizing objectives does not infer that attainment of the objectives is either simple or easy. No time factor is included for the actual accomplishment of the objectives.

—But until objectives are clearly understood and shared by people of different races, colors, creeds and nationalities, no real progress can be made towards removing the threat which can effectively destroy civilization on both sides of an air-atomic war . . . as well as in the territories in between.

***World War I.*** **This 1917 equipment was used by 1941 draftees. Were the "causes" of both wars the same?**


*Copyright 1957, Howard G. Kurtz, Jr.*

***World War II.*** **By 1941 Americans had more than $500,000,000 invested in Hitler's Germany. Both countries were "capitalistic" yet war came.**

"All evil in the world today is caused by wicked men who do not believe in a Supreme Being and who claim to believe only in material values."

In many different ways, this theme is repeated constantly to religious people, as the explanation of the cause of the oncoming war. And yet there is no observable evidence in history that spiritual or philosophic beliefs are the strategic factor in war, despite historians trying to prove otherwise.

*Example:* The American people are a "Christian" people. And yet every war that the American people have fought has been against similarly "Christian" people . . . against "Christian" Englishmen . . . against "Christian" Spaniards . . . against "Christian" Mexicans . . . and "Christian" Germans twice in one generation, in present times.

"All evil in the world today is caused by the fact that the National Government owns the automobile factories in the Soviet Union, while private corporations own the automobile factories in America."

In countless variations this theme is hammered into the minds of the American people, through billions of dollars' worth of national advertising, pronouncements by business associations, political speeches, ghost-written feature articles and other means of molding public opinion. (The constant repetition of the theme in an effort to sell the public is quite parallel to the similar efforts in the U.S.S.R. to sell the Russian people on the idea that the war is being brought about because of the American beliefs in "capitalism.")

THIS thesis is devoid of support from any objective analysis of the phenomenon of war.

*Example:* America is mobilizing for possible large-scale war in 1957 with observable patterns almost identical to American mobilization in 1941.

But, within this short period, America has mobilized against two radically different national political-economies.

In 1941, Americans were mobilizing for defense against a threatening Germany which encased "capitalism" so similar to American capitalism that some American citizens had invested more than $500,000,000 in the German industries which manufactured Hitler's military might.

But, in 1957, Americans are mobilizing against a threatening Soviet Union which encases "communism" radically different from American political beliefs.

The American people can observe from their own recent personal experiences that the kind of politics encased in a nation threatening to America, is of no controlling

***Korea.*** **Here the struggle was between "communism" and "capitalism."**

***World War III?*** **The author proposes a world-wide safety organization to prevent war.**

interest. When threatened, the American people can be mobilized to fight against a country professing beliefs in "capitalism," or "communism," or any other kind of "ism." When threatened, the American people can be mobilized to fight against the threatening nation with utter disregard for the current peculiarities of the political faiths of the opposing people.

From a list of all wars between nations since nations were formed, one critical factor would be found to be present each time the phenomenon occurred.

That critical factor is *national military power*.

This conclusion is so blunt, and so obvious, that one's first reactions are to feel that it is frivolous.

But it can be proven to be a valid and important conclusion.

Is national military power the strategic factor in the phenomenon of war between nations?

The conclusions of the writer are two-fold:

I. National military power is the single, strategic, tangible factor in the phenomenon of war. If national military power had been absent, none of the wars between nations would have occurred. But with national military power present, and controlled by individual nations, the patterns of war generate, endlessly, with the dynamics of a new war emerging immediately after the grim conclusion of each "last" war. These patterns are predictable to an important degree, and will be sketched later in greater detail. National military power is the critical factor which makes the phenomenon predictable, in an engineering sense. It is the concrete factor which can be found in all of the academic "causes" of war when there is some real correlation between the "cause" and war.

Strange, exotic spiritual or philosophic beliefs may be subjects for academic study, but they are not a cause of war until they are encased in a foreign nation which has become a military threat. Differences in economic ritual are subjects for endless scholarly analysis, but they are not a cause of war until they become encased in a foreign nation which has become a military threat.

II. The human dynamic aroused by a threatening national military power is in a realm beyond the jurisdiction of the conscious mind, in which people intentionally are taught different theological, philosophic, or political beliefs, and beyond the conscious identifications of race, color and nationality which tend to erect barriers between people. This human dynamic is anxiety. Anxiety is a complex, instinctive, automatic, compulsive human reaction to potential danger under certain conditions. These conditions are met when a person's existence appears to be threatened, and when normal reactions to such danger are thwarted and frustrated. Under certain specific environmental conditions, anxiety generates, and human judgments, attitudes and actions become predictable.

It is here that the research into the dynamics of war tends to coincide with the writer's twenty years of work and study of the controls which anxiety exerts over public judgments, attitudes and actions among people of all races, colors, creeds and nationalities. It has been study of passenger reactions in flight on air transport planes along the world's airways.

There is increasing evidence that this work can be verified and agreed to by people of all differing faiths and beliefs. People of all races, colors, creeds and nationalities tend to have judgments, attitudes and observable actions similar to people of all races, colors, creeds and nationalities when they are placed in the same environment which arouses anxiety. Judgments, attitudes, and behavior are predictable under these conditions.

These are observations in the changing environment of potential hazard which precedes a war and the changing behavior patterns of people in this changing environment.

During the prolonged period of observation, it is assumed that there is an increasing threat to this nation under the observation from an expanding foreign national military power.

As potential danger intensifies, both normal fear-reactions are frustrated and thwarted in the citizens of this nation; (1) escape is impossible or impracticable and (2) it is equally impossible for the individual citizen to remove the threat or control of his own destiny. The citizens are in a situation similar to passengers in an airplane, in flight, when something has happened to arouse apprehension.

It is possible to observe important changes in the behavior of the citizens as anxiety is intensified.

In contrast to the observed behavior of these same citizens at some other time when no hint or threat of war exists, there are noticeable changes in general behavior over a period of years as the potential threat from a foreign military power is increasing. Many pages could be filled with these observable behavior changes.

BUT defensive expansion is the over-all label which tends to identify all observable behavior of the people in a nation existing under increasing threat from a foreign military power.

But why is the foreign military power expanding its threat to the nation being observed? Why is it aggressive?

This leads to the observable patterns of the generation of war. As two electric fields interact upon each other, in an engineering laboratory, when two magnets are brought into a critical relationship to each other . . . so there is a new dynamic when two powerful national military powers emerge in a special relationship to each other.

The phenomenon we have been observing is in two parts where (1) the national military power of one nation (2) creates an environment in a second nation which intensified anxiety and apprehension in this second nation.

A new dynamic emerges when this second nation's national military power creates a similar environment of anxiety and apprehension in the first nation.

The national military power of each nation generates anxiety among the citizens of the other nation.

(*Continued on page 39*)

## *About the Author . . .*

**Mr. Kurtz**

A senior associate in the management consulting organization, Handy Associates of New York, Howard G. Kurtz, Jr. is well known in the United States and in the international air transport industry. He was born October 14, 1907, at Ardmore, Pa. Originally in the class of 1929 at Penn State, Mr. Kurtz left school for one year to graduate from the United States Army Flying School at Kelly Field. He returned to Penn State to receive the degree of Bachelor of Science in industrial engineering with the class of 1930.

Since this time Mr. Kurtz has been associated with air transportation. He was with American Airlines for about eighteen years after leaving school, rising to the position of assistant to the vice president and general manager. He then became assistant to the executive vice president, Atlantic Division, Pan American World Airways. Since leaving Pan American in 1953, he has been with Handy Associates.

He has written a psychological study of human anxiety in flight which has received international recognition. The study, "The Common Man—Up in the Air," is widely distributed by the International Air Transport Association. In 1956, the World Brotherhood Award was presented to Mr. Kurtz by the National Conference of Christians and Jews, in recognition for the more than 31,000,000 reprints across the world of the basic theme of another paper Mr. Kurtz wrote, titled "Toward Tomorrow."

# Engineering Employment Practices Digest

*A short digest of a monthly bulletin published by the National Society of Professional Engineers in the interest of advancing cooperative relations between professional engineers and their employers. To regularly receive the complete publication which is distributed widely to industrial, commercial and educational organizations, write the NSPE, 2029 K St., N.W., Washington 6, D. C.*

✓ **Seventh in a series of annual surveys by Donald C. Hunt, University of Detroit, shows eighty-nine per cent of engineering graduates were employed at commencement. Four per cent were "unemployed" with six per cent entering graduate school and one per cent headed for military service. Twenty per cent said that opportunity to do graduate work was one of the reasons they selected their employer. Eighty-nine per cent obtained their first job through the placement office. Average starting monthly salary was $492 for engineers, compared to $414 for arts and science and $400 for commerce.**

* * * * *

✓ *A checklist on probabilities of a union's chances of success in organizing engineering employees by* Steel *magazine mentions twelve elements of good professional practice by management. Among the items on the checklist are: difference in starting salary and salary of man with five year's experience at least $175, no time clocks, patent rights for engineers, adequate technician help provided, engineers have fringe benefits equal to production workers, help finance engineers through advanced education, fair merit review system, help finance participation of engineers in professional societies. The magazine's scoring system states that of the twelve listed items the employer should have at least nine "yeses" to present a "remote" chance for the union to succeed.*

* * * * *

✓ Patent Incentive Plan of Lear, Inc., Santa Monica, Calif., provides cash payments to employees from $25 to more than $20,000. An employee-inventor gets $25 when the company files a patent application, and $50 more when the patent is issued. If the patent is licensed to another company, the inventor receives a sliding scale percentage of the net cash royalties which can reach $20,000, or more.

* * * * *

✓ **A New York firm of technical manpower consultants, Deutsch & Shea, Inc., announce the forthcoming publication, *The Supply and Demand of Engineers, 1950-1960*, which refutes recent "anti-shortage" claims. A preliminary report on the new book attacks the recent publication, *The Demand and Supply of Scientific Personnel*, by Blank and Stigler which said it is doubtful that there has been at any time a severe shortage of engineers. The new analysis says there has been a serious shortage and that it will continue in some measure in the immediate future. The authors point to a rise of more than sixty-five per cent between 1950 and 1957 in starting salaries for engineers, compared to an increase of only 16.1 per cent in the consumer price index. They criticize the Blank-Stigler economic analysis which led to the conclusion that there was not a shortage.**

* * * * *

✓ *A recent decision of the NLRB on professional status of accountants recites some interesting principles of general professional interest. In turning down the professional status claim for the accountants the Board noted: (1) none of the employees were certified public accountants, (2) the employer did not require the accounting employees to have a collegiate education in accounting, (3) the employer followed the policy of training employees of varying degrees of education and/or experience to handle the accounting functions peculiar to its operations.*

* * * * *

✓ A New Jersey firm, Stavid Engineering, reports favorable results on its policy of hiring engineers forty-five years and over. The firm said twenty-five of its 250-man engineering force are over fifty, and it accepts engineers past the normal retirement age of sixty-five. The policy has proved profitable in terms of growth, meeting the manpower shortage and in reduced absences and turnover, the firm said. They also point out that the younger engineers have profited by the association with more experienced men. New employees over fifty-five do not come under the company pension plan.

* * * * *

✓ **A three-year test of a new personnel evaluation plan at the General Electric Flight Propulsion Laboratory Department confirms the basic principle that evaluation should be a continuing process in which employees themselves are active participants.**

*A Logical Step . . .*

# From Engineer to Manufacturer

By

THEODORE W. VAN ZELST, P.E.,

*President, Soiltest, Incorporated*

TEN years ago the science of soil mechanics and foundation engineering was relatively unknown. After World War II there were only about twelve universities in the United States actively teaching the subject and offering laboratory instruction in soil mechanics. There were then only a few commercial testing laboratories or consulting engineering firms qualified to do soil testing and consulting work on soils and foundation problems.

The technological advances in the last ten years, the rapid rise of prices and the resultant high cost of construction, have all contributed to the development of a company named SOILTEST, Inc.

Now, in 1957, there are over 200 universities and colleges in the United States teaching the subject of soil mechanics. More than 2,000 consulting engineering firms and commercial educational and governmental laboratories do specialized work in soils and foundations.

These consulting engineers and laboratories need specialized field and laboratory apparatus to carry out their evaluation of soil properties. The original company from which SOILTEST, Inc., has developed, started in 1946 as a testing laboratory specializing in soil testing, foundation borings and foundation engineering. The intention was to have a complete laboratory installation in Chicago, Illinois, to serve customers from the Midwest United States. The laboratory was to contain all of the routine testing instruments as well as specialized apparatus for special problems in research of soils.

After the formation of the company it became apparent that only a very few items of test equipment necessary to outfit the laboratory were available from commercial sources. The few items available were usually poorly designed and extremely costly.

**A mobile laboratory, manufactured by Soiltest Inc. is shown here. Theodore Van Zelst, president of Soiltest, Inc., is on left and E. Breech, Soiltest sales manager is on the right.**

WE found that if we were to develop a laboratory as planned, it would be necessary to design our own testing apparatus. This was done. When we reached the point of trying to locate machine shops to make the equipment, we again found prices completely out of our range. None of the shops understood the operating function of this special test apparatus and their shop estimators added a wide margin of safety to take care of the "confusion factor." The few items that were made on a contract basis by local machine shops, almost drained our young company's meager finances because of the high price and non-conformance with the drawings and specifications.

The next realism which struck us was the fact that if we were to have a laboratory at all it would be necessary for us to both design the apparatus and make it in our own shop, under our own control. We established a small machine shop in a two car garage building and set to work to equip the laboratory.

As fast as the new equipment was added to our laboratory, and visitors had a chance to see it in operation, we received requests for quotations for the same equipment to be supplied to other laboratories! Originally we had no intention of entering into the manufacturing business. However, the market appeared to exist and we started to offer quotations on the standard equipment which we had designed. Soon orders were received from all parts

of the world. We then had not only a soil testing laboratory, but also a manufacturing business.

The manufacturing activity expanded rapidly. In 1951 it became apparent we were competing with our customers by both manufacturing and operating a testing laboratory. In that year the new company, SOILTEST, Inc., was founded using the trade name "SOILTEST," which has been used since the manufacture of the first piece of test apparatus. The manufacturing and laboratory companies completely separated and are now totally independent and under separate ownership.

In the subsequent ten years, SOILTEST, Inc., has reached a point where its testing apparatus is used in over 2,500 laboratories in some eighty-five countries. Daily shipments are made to all parts of the world from the Chicago factory. The company has over seventy exclusive sales representatives in major countries. SOILTEST equipment has been accepted as a standard throughout the world and it is significant that a very high percentage of the company's products are sold outside of the United States. Interest in soil mechanics and foundation engineering is not centered in the United States alone; the interest is international.

THE original "catalog" published by SOILTEST consisted of a single page with photographs and simple descriptions of three items. The latest catalog illustrates and describes over 1,350 items of soils, concrete and asphalt testing apparatus, and has 128 pages.

The expansion of interest in soil mechanics and related testing activities has initiated many changes in the design and use of test apparatus. The early designs were made on a functional basis. It was considered necessary to have the working parts and controls located in the open so that the test operator could see all of the parts while the test was being conducted and make necessary adjustments during the test.

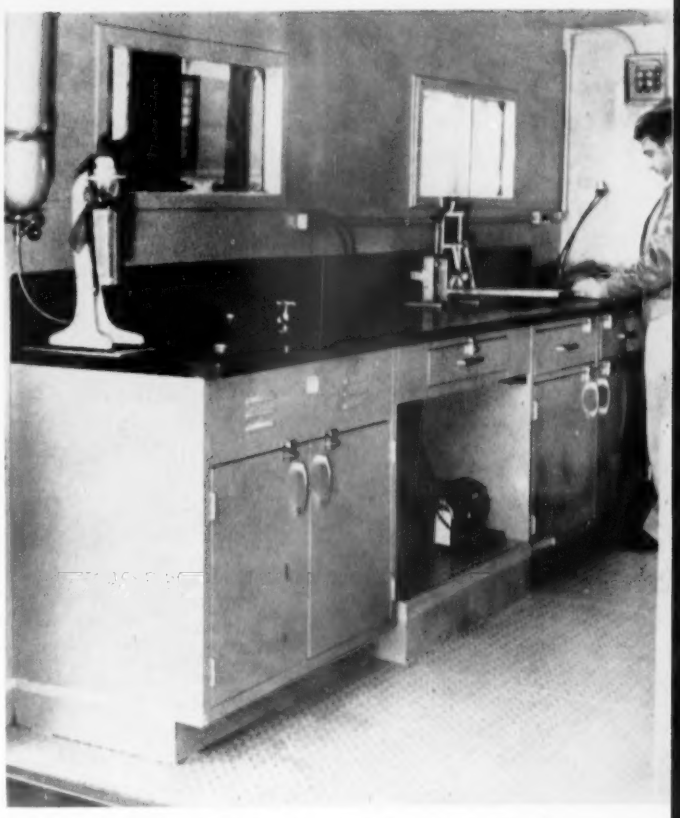
In the early post-war days, the man running the laboratory tests was usually an experienced engineer. The trend rapidly changed as engineers became scarcer and it became necessary to have laboratory technicians and other personnel, perform the tests. With the changes in operating personnel came changes in the appearance of equipment. From the functional design, a streamlined design has evolved. The working parts are enclosed in modern dust-proof and pleasingly shaped and finished cabinets or housings. The modern trend calls for testing equipment to be simple to operate.

Demand has increased for automatic devices to eliminate personnel errors and to reduce manpower requirements in the laboratory. Typical examples of time-saving devices in the soil mechanics field are the mechanical soil trimming lathe used to prepare cylindrical test specimens; the automatic mechanical compactor for rapid and uniform moisture-density tests; and the Volumeasure which greatly speeds up in-place field density tests of soils.

In the early years, we relied on civil engineers to do equipment designing. We felt that the designer should have the experience in actually performing the tests to design a proper piece of equipment. Later, our thinking changed and mechanical engineers handled all of the equipment design with the civil engineers guiding the functional design.

Necessity for increased production and the complexity of many of the new pieces of equipment requires that a company such as SOILTEST, manufacturing specialized equipment, have available the services of mechanical, electrical, chemical and civil engineers. Their job assignments range from design and experimentation with special types of castings for use in hydraulic pressure systems; design and calibration of specially blown glass test containers; development of new hydraulic components and systems; calibration of test equipment and similar projects. Thus, a small company, starting as a testing laboratory, has grown into one of manufacturing a diverse line of standard and specialized apparatus for construction materials.

Interestingly, the advancement of the design of modern test equipment has not brought about a corresponding increase in the selling prices of this equipment. This has been accomplished by constant improvement of design of the apparatus produced in our factory. It is expensive to improve design, but with production considered, these costs are quickly paid for in savings of manufacturing time. The added savings in production costs go a long way in absorbing increases in labor and material. The acceptance of SOILTEST products and the advancement of the testing industry have assisted in further decreasing actual manufacturing costs by enabling us to run larger production quantities. These savings are used to offset material and other economic increases.



**Ovens, hot plates, mixers, shakers and moisture control equipment are among the appliances needed for soil testing. These, as well as the air conditioning, heating and air compressor system, and the truck's interior lighting, are powered by a Kohler electric plant which develops output of 3500 watts.**

**Theodore Van Zelst of Soiltest is shown demonstrating various items of soil testing equipment to personnel of the Department of Public Works, Bogota, Colombia, South America. The Soiltest firm was started after World War II by engineers who saw the great need for such equipment. From modest beginnings in a two-car garage, the company is now known around the world and supplies engineers in many countries.**

Experience in the organization and management of SOILTEST, Inc., has confirmed the opinion that engineers have a vital place in manufacturing. Modern technology has brought engineering into all consumer and industrial manufacturing. Engineers have the know-how in the use and operation of a product. There are also opportunities for engineers in the sale of a product.

THE items manufactured by SOILTEST, Inc., are usually sold to engineers. The engineering background of our company and our interest in engineering activities has aided us greatly in the development of the market for our products.

Most engineers are well aware of the necessity of testing construction materials. However, their superiors in government or private industry are often non-technical people who do not share the same feeling. It is necessary to impress top management and legislative groups with the necessity for engineering evaluation of the materials used in construction.

Dramatic construction failures are one of the ways to demonstrate the necessity for proper engineering design and control. Costly failures in concrete construction in public housing in one of the Carribbean area countries forced the government to decree that all concrete producers must have their own modern testing laboratories. These laboratories are further cross-checked by newly established governmental testing laboratories.

In a South American country, failure of a large road project in less than one year after construction induced the legislature to pass laws requiring all road contractors to maintain fully equipped laboratories. This government has also established a large central laboratory.

The world-wide economic developments and the high costs of construction are convincing more and more authorities of the need for proper engineering design and construction control. With this comes the need for more laboratory and field testing equipment to be used by engineers to effect this design and control. There has been a tremendous development in the field of design and manufacture of laboratory and field engineering testing equipment. There is still much to be done.

SOILTEST plans to continue to develop its products and its market through the use of engineering principles. Engineering is necessary in all aspects of manufacturing and sales of an engineered product. Thus, the step from engineer to manufacturer is a logical one.—***End.***

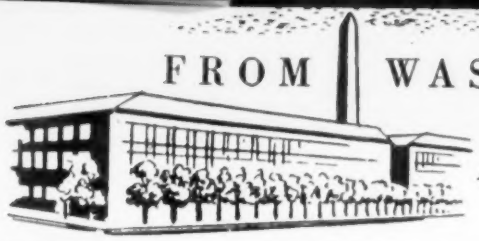
---

## *About the Author . . .*

**Mr. Van Zelst**

Theodore W. Van Zelst was a founder of SOILTEST, Inc., a Chicago firm specializing in the design and manufacture of engineering test apparatus for soils, concrete and asphalt. Earlier activities included research work in soil mechanics at Northwestern University, field work in airfield evaluation for the U. S. Navy and soils engineering for the Chicago Department of Subways and Superhighways. He was also formerly associated with a commercial soil testing laboratory and drilling organization.

He is a graduate of Northwestern University and the University of California. Mr. Van Zelst, an NSPE member, started in business in 1946, right out of graduate school at Northwestern University. The firm that he now heads is one of the largest manufacturers of engineering test equipment for soils, concrete and asphalt and has sales representatives in seventy countries of the world.



# FROM WASHINGTON

By
Milton F. Lunch,
*N.S.P.E.'s Legislative Analyst*

## RECOGNITION OF REGISTRATION

IN August, 1956, Congress amended the Watershed Protection and Flood Prevention Act, providing Federal assistance to local organizations (states, political subdivisions of states, soil or water conservation districts, flood prevention or control districts, etc.) in carrying out a program for the development, use and conservation of the nation's soil and water resources. Relatively few professional engineers will probably have occasion to operate under this particular law, but some of the administrative principles it has brought forth are of interest and importance to the entire profession.

Now, approximately one year after the law was passed, the Secretary of Agriculture has issued the necessary regulations and policies to govern the detailed procedures to be followed by the users of the Act. Of utmost importance to the engineering profession is that portion of the regulation which deals with the interpretation of the terms, "professional engineer" and "competent engineer" as contained in the basic law. The Administrator of the Soil Conservation Service, who has been assigned the Secretary's responsibilities in this connection, has ruled that the two terms are to be considered synonymous. The first qualification in meeting the interpretation is:

**Under Watershed Act a Federal agency recognizes registration as a sound and proper condition in implementing a government program. Above: A retaining wall is constructed along the Mississippi River in St. Paul, Minn.**

> The engineer must be registered in the State in which the construction is to be undertaken and be properly authorized to practice engineering in compliance with the laws of the States. In those States where registration is not required, the engineer or organization shall have demonstrated its ability to properly carry out the work.

It is worthy of note that a Federal agency has thus recognized state engineering registration as a sound and proper condition in implementing a Federal program. There is no explanation of the reference to states where registration is not required, but it may be surmised that this reservation was intended to apply to those few instances in which registration is based on a voluntary, rather than a mandatory, statute.

In addition to the registration qualification, the SCS provides that the professional engineer, or competent professional members of his staff, must have satisfactory experience in the phase of engineering work to be undertaken. In addition, there must be facilities and staff competent to perform the work in the specific time. Cost of the engineering services must be reasonable when compared to the cost of doing work with the SCS engineers, giving due consideration to the differential existing between private and public costs. This latter provision is not applicable when the local organization provides the engineering services without reimbursement.

When structures are for municipal or industrial water supplies, the local organization must employ non-Federal professional engineers for design, preparation of contracts and specifications, awarding of contracts, and supervision of construction. When projects are for flood prevention or for agricultural water management, the local organization has the option of employing non-Federal engineers or using the technical services of the Soil Conservation Service. If the local organization employs private professional engineers for this work the Federal Government reimburses it for the services.

A further significant recognition of a principle basic in the engineering profession is found in the regulation with reference to contracting for engineering services. The

*(Please turn the page)*

office negotiating the contract, it is stated, "must be sure that all work performed under a negotiated contract is done in keeping with contract specifications and in conformance with State laws regarding registration and approval to practice engineering within the State."

This is followed by the warning that "all contracts (for engineering services) must be negotiated in an ethical manner . . . ," supplemented later in the regulations by the statement that "the code of ethics of engineers does not permit competitive bidding for engineering services."

It was noted shortly after the law was passed (AE, Oct., 1956) that an important gain had been achieved through Congressional use of "professional engineer" in a statute, contrasted with previous legislative acts which made reference to "engineer" without the important professional designation. Now, may be added the more significant gain of a specific recognition of the place of the state engineering registration laws in determining qualification for engineering services, and the profession's ethical bar to competitive bidding.

### Federal Aid To Higher Education

In what may be termed a "middle of the road" program, the President's Committee on Education Beyond the High School has announced against instituting a large-scale program of Federal scholarships at this time. In its 108-page report, however, the high-level group recommends the development of an experimental, Federally supported "work-study" program which would provide 25,000 to 50,000 "notably able and needy students" with appropriate employment at fair wages in the service of the institutions attended. The report finds that presently available scholarships are grossly inadequate. The total available—roughly $60 million per year—is about one-tenth of what would be required to provide a $750 scholarship for four years to some 200,000 of the ablest and neediest high school graduates annually, it is stated. The Committee states that while it is encouraged by the marked recent expansion of scholarships from private sources, there is need for much further expansion, both at the graduate and undergraduate level. "If these programs should later prove to be inadequate, the Committee believes that a Federal scholarship program to fill the gap is inevitable." Meanwhile, it is added, the Federal Government can help most in other directions. Some of the major suggestions are:

- Federal revenue laws be revised, with appropriate safeguards, in ways which will permit deductions or credits on income tax returns by students, their parents or others who contribute to meeting the expenditures necessarily incurred in obtaining formal education beyond high school; and, further, that provisions be included which will grant proportionately greater tax benefit to those least able to afford those expenditures.

- The absolute highest priority in the use of available funds be given to raising faculty salaries, with the goal of doubling the average level within five to ten years, and with particular attention to increasing the spread between the bottom and the top of each institution's salary structure.

- The Committee urges all who are concerned with broadening college opportunities for young people to note the important distinction between aiding the student to get a good college education and aiding the college to give one. Both efforts must be kept in balance.

- That the Federal Government promptly develop and implement a consistent and equitable policy for the payment of full costs, including indirect costs to institutions, of Federal contract research programs operating in or through colleges and universities, and that as rapidly as feasible more equitable policies should be adopted for payment for other types of services and programs provided to the Federal Government which in the past have often imposed heavy financial burdens on these institutions.

The highest priority in the use of funds should be to raise faculty salaries at such institutions as the University of Wisconsin shown above.

- That the Federal revenue laws be revised in ways which will even more strongly encourage larger contributions from more individuals to private and public nonprofit higher education institutions.

These are only a few of the Committee's recommendations and observations. Those seriously interested in educational problems would do well to secure the full report from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., (55¢ per copy). The report was issued too late for any Congressional action this year, but there has been general praise for many of the suggestions from Congressional leaders, and indications that strong efforts will be made next year to implement that portion of the program which requires Federal action.

# Joint NSPE-University Utilization Conferences Scheduled

THREE conferences in a series started in 1957 on the utilization of scientists and engineers will be held during September.

The conferences, co-sponsored by NSPE state societies, will be held at Charleston, West Virginia, September 5-6; and Houston, Texas, September 11-12, and State College, Pennsylvania, September 17-18.

The first conference in the series was held March 29-30 at Michigan State University. It was sponsored by the Michigan Society of Professional Engineers and the University. The series is being organized in cooperation with the President's Committee on Scientists and Engineers.

Discussions in the conferences will center around a recognition of the fact that the country's most pressing problems of scientific manpower are the immediate problems—such as better utilization of existing manpower.

The Charleston conference will be sponsored by the West Virginia University College of Engineering and School of Mines, and the West Virginia Society of Professional Engineers. Co-chairmen of the sponsoring organizations are: Chester A. Arents, dean of the College of Engineering, West Virginia University; and Ross B. Johnston, secretary of the West Virginia Society of Professional Engineers.

Principal speaker at the two-day Charleston affair will be Granville M. Read, chief engineer, E. I. du Pont de Nemours & Company. Other keynote speakers and their topics will be: Paul H. Robbins, NSPE executive director, "Utilization — A Necessity for Employer and Professional Employee;" and Karl O. Werwath, president, Milwaukee School of Engineering, "The Role of the Engineering Technician on the Manpower Team."

The purpose of the Charleston conference is to:

1. Allow an interchange of ideas between individuals representing organizations, industries and educational institutions.
2. Have experts report on latest facts as analyzed from their research, and describe their experiences with different solutions to the problem.
3. Present problems involving the utilization of engineering and scientific personnel.

Discussions at the conference will be divided into five "clinics," each having a group of panel members. Topics covered by the panelists will be: "Incentives to Develop Maximum Potential of Scientific Staff," "Technicians Increase Professional Productivity," "Value of Educational Opportunities in the Community," "Selection and Training of Scientific Personnel," and "Recognizing Engineers as Part of Management."

Houston was selected as the site of the first of three metropolitan area conferences on utilization because of the expanding industrial development in the Gulf Coast area. Principal speaker at the Houston area conference will be Joseph R. Gocke, research director of The Public Opinion Index for Industry, Princeton, New Jersey. He will present the results of the recently published survey on "Career Satisfactions of Professional Engineers In Industry" made for the Professional Engineers Conference Board for Industry, in cooperation with NSPE.

E. C. Rechtin, general manager, Gulf District, Bethlehem Steel Company, Beaumont, Texas, will be the principal speaker at a group luncheon. His topic will be "Engineer Wanted—Reward."

Three panel discussion groups will take up the program for the first day. Panel topics will be: "Training and Continued Education of Scientists and Engineers," "Problems of Compensation and Recognition for Scientists and Engineers," and "Problems in Utilization and Measurement of Performance."

Dr. Gordon K. Teal, assistant vice president and director, materials and components research, Texas Instruments, Inc., will be the principal speaker at a banquet session on the first day. He will speak on "Meeting the Scientific and Technological Needs of Our National Economy."

The program for the second day of the Houston area conference will feature a symposium on the subject of "The Role of the Engineering Technician." Dr. Frank M. Tiller, dean of

(Continued on page 49)

***Discuss Conference Plans***

**Plans for the West Virginia conference are being worked out by the group above. Reading from l. to r., they are: Dr. William G. Torpey, special consultant to President Eisenhower's Committee on Scientists and Engineers; Ross B. Johnston, Executive Secretary, West Virginia Society of Professional Engineers, and Dean Chester A. Arents, West Virginia University, College of Engineering and School of Mines.**

*In Bismarck, N. Dak. . . .*

# Engineering Education Discussion Slated for Fall Meeting, Oct. 17-19

THE role of industry and the Federal Government in financing engineering school education in the near future will be discussed by the NSPE Board of Directors at the fall meeting in Bismarck, North Dakota, October 17-19.

Discussions on engineering education will be held by the Professional Development Group.

At the Bismarck meeting, the NSPE Board members will also hear discussions on the implications of recent anti-union election results among engineers in industry; the outside employment of engineers employed by the Federal Government; plans for legislative action on professional standards of engineers in government agencies; and the role of the societies in engineering matters as proposed in the recent "Coover Plan" for engineering unity.

The Board meeting is scheduled to get underway Thursday evening, October 17, at 7:30 p. m. On Friday morning an address of welcome will be given by the Honorable Evan C. Lips, mayor of Bismarck, in the House Chambers of the State Capitol Building where all meetings will be held. Hotel headquarters for the affair will be the Grand Pacific Hotel.

Ladies' Program

THURSDAY, OCTOBER 17

6:00 p.m. Smorgasbord — Bismarck Municipal Country Club
Ladies adjourn to Western Get-together Party.

FRIDAY, OCTOBER 18

Western Afternoon — Mrs. L. W. Veigel

6:00 p.m. Cocktail Party and Banquet — Bismarck Municipal Country Club.

Regional luncheons are planned for Friday noon following the morning's business sessions. The six NSPE area vice presidents will preside over their respective region at the luncheons in the hotel.

In the evening, a 6:00 p. m. cocktail party is slated at the Bismarck Municipal Country Club—to be followed by a banquet. Governor John E. Davis of North Dakota will be the principal speaker at the latter occasion. Garvin H. Dyer, president of the National Society, will preside, and Joseph H. Kirby, president of the North Dakota SPE, will serve as toastmaster.

The business meetings will continue on Saturday morning with adjournment tentatively set for one p. m.

The North Dakota Society has also planned its annual meeting in conjunction with the NSPE get-together. On Thursday, they will attend the Smorgasbord at the Bismarck Municipal Country Club and attend the evening meeting of the NSPE Board. On Friday, the North Dakota group will attend the Board meetings in the House Chambers and they also have special committee meetings scheduled in the Hearing Room, ground floor, of the Capitol. Afterwards they will attend the cocktail party and banquet at the Country Club.

Saturday will find the North Dakota SPE assembling at 9:00 a. m. in the Hearing Room for their regular business meeting and election of officers.

During their North Dakota visit, NSPE members have been invited to inspect the new and modern refinery at Mandan, N. Dak., and take a trip to the largest rolled earth fill in the world at Garrison Dam. Members may also want to take advantage of the pheasant hunting season before or after the fall session.

An interesting program is likewise on tap for the ladies.

***Fill Out***

***and***

***Mail Today!***

**NSPE Fall Meeting, October 17-19**
**Bismarck, North Dakota**
**Room Reservations**

**Please make the following reservations:**

**Single—shower** . . . . . **$4.50** ———

**Single—bath** . . . . . **$5.00-$7.00** ———

**Twin—bath** . . . . . **$8.00-$10.00** ———

**For** . . . . . .

**arriving October** . . . . . **at** . . . . . **a.m. or p.m.**

**Mail to: Housing Committee, Grand Pacific Hotel, Bismarck, North Dakota**

**Mode of Transportation: TRAIN** . . . . **AUTO** . . . **PLANE** . . .

**SIGNED** . . . . . .

**(Please print or type)**

**ADDRESS** . . . . . .

**Street** **City** **State**

# Here is the Program

*Thursday, October 17, 1957*

9:00 a.m. to 5 p.m. NSPE Executive Committee Meeting Board Room* (*Provident Life Insurance Building)

6:00 p.m. Smorgasbord—Bismarck Municipal Country Club

7:30 p.m. Board Meeting opens. Agenda as follows:
- Roll Call of Members of the Board
- Reading of Minutes of Previous Meeting
- Reading of Communications
- Report of Officers
- Report of Executive Committee

*Friday, October 18, 1957*—All meeting sessions at the House Chambers, State Capitol

9:00 a.m. Address of Welcome:
- Hon. Evan E. Lips, Mayor, Bismarck, North Dakota

POLICY OPERATIONS GROUP—Vice President Kennedy, presiding
- Review of Financial Limitations of Society
- Revisions to 1957 Budget
- Proposed 1958 Budget
- Amendments to Constitution and Bylaws
- Review of Legislative Developments

12:30 p.m. Regional Luncheons ..... Grand Pacific Hotel
- Western Region; Vice President L. R. Durkee, presiding
- North Central Region; Vice President W. L. Hindermann, presiding
- Northeastern Region; Vice President A. H. Kidder, presiding
- Central Region; Vice President H. G. Kennedy, presiding
- Southeastern Region; Vice President J. B. McGaughy, presiding
- Southwestern Region; Vice President Clark A. Dunn, presiding

1:30 p.m. PROFESSIONAL RELATIONS GROUP—Vice President Kidder, presiding
- Reaction to Coover Plan
- Interim Report—Committee on Improved Professional Relations
- Code of Interprofessional Practice
- ECPD-NSPE Relations
- AIA-NSPE Relations

PROFESSIONAL EMPLOYMENT GROUP—Vice President Hindermann, presiding
- Status of Ethical Practices Brochure
- Plans for Legislative Action on Professional Standards of Federal Engineers
- Reconsideration of Policy on Outside Employment of Engineers Employed by the Federal Government
- State and Chapter Use of Engineer-in-Industry Material
- Plans for State Employment Practices Conferences
- Engineering Unionization Developments
- Professional Course for Students

6:00 p.m. Cocktail Party ..... Bismarck Municipal Country Club

7:00 p.m. Banquet ..... Bismarck Municipal Country Club
- Presiding—President Garvin H. Dyer, National Society of Professional Engineers
- Toastmaster—President Joseph R. Kirby, North Dakota Society of Professional Engineers
- Address—Governor John E. Davis of North Dakota

*Saturday, October 19, 1957*

9:00 a.m. PROFESSIONAL DEVELOPMENT GROUP—Vice President Dunn, presiding
- High School Clubs
- Student Chapter Development
- Young Engineer Programs
- Young Engineers Month
- Reconsideration Policy on Federal Government and Engineering Education
- Publication of proposed Ideal Law and Revised Model Law

PUBLIC RELATIONS GROUP—Vice President McGaughy, presiding
- Program for Engineers' Week
- Broadening our Public Relations Program

ORGANIZATIONAL FUNCTIONS GROUP—Vice President Durkee, presiding
- Use of Indoctrination Kit
- State Membership Promotion Mail Campaign
- Interim Report on Membership Contest
- Organizational and Committee Revisions

1:00 p.m. Adjournment

## *Governor to Attend*

Governor John E. Davis of North Dakota, center, signs his personal invitation to attend the fall meeting as Edward J. Booth, left, general chairman of the session, and Joseph R. Kirby, North Dakota SPE president, look on.

## *Meetings at Capitol*

North Dakota's Capitol Building where the meetings will be held in the House Chambers.

## *Bismarck Country Club*

The Bismarck Municipal Country Club will be the site of several social events.

*Editor's Note—The two extracted papers presented here were given at a conference in conjunction with the recent annual meeting of the National Society of Professional Engineers. The conference on young engineers in government was held simultaneously with conferences devoted to problems of young engineers in industry, education, and private practice. Each session featured leading figures from the engineering field involved.*

*These papers from the conference on government are the first in a series to be presented by the American Engineer. Future issues will carry extracts from papers presented at the other conferences.*

## *A Symposium . . .*

# Professional Development of the Young Engineer in Government

### *Participants:*

**D. H. McCOSKEY, Chief, Engineering Branch, Southwestern Division, Corps of Engineers, Dallas, Texas**

**R. L. SCHMIDT, Ass't. Engineer, Land Service Roads, Texas Highway Department, Austin, Texas**

## *Mr. McCoskey's Remarks . . .*

THE program title for this conference is The Young Engineer In Government. However, in discussing the scope of the subject with the conference moderator, he indicated that it was desired to point the conference towards the professional development of the young engineer. Consequently, an effort has been made in the preparation of this paper to point the subject matter toward the opportunities for professional development for young engineers in the Federal service.

In order to cover the complete range of the professional development it may be desirable to consider three time periods, each of which represents fairly definite phases of a career although each merges into and influences the succeeding period.

1. *University Educational Period.* The four or five years of formal university training period but extending back to include the influence of high school training and including on-the-job training during university studies as a co-op student or as part-time and summer employment.

2. *Engineer in Training Period.* The first one to two years of employment on engineering work after qualifying for a Bachelor of Science degree, merging into the five year period after graduation in which the engineer will have established himself in the profession, acquired one or more specialties and qualified for membership in technical societies and for a license.

3. *Achievement Period.* The remainder of the 10-year period after graduation when selection of the most promising fields for application of effort should be made based on previous qualification and aptitudes.

*University Educational Period.*

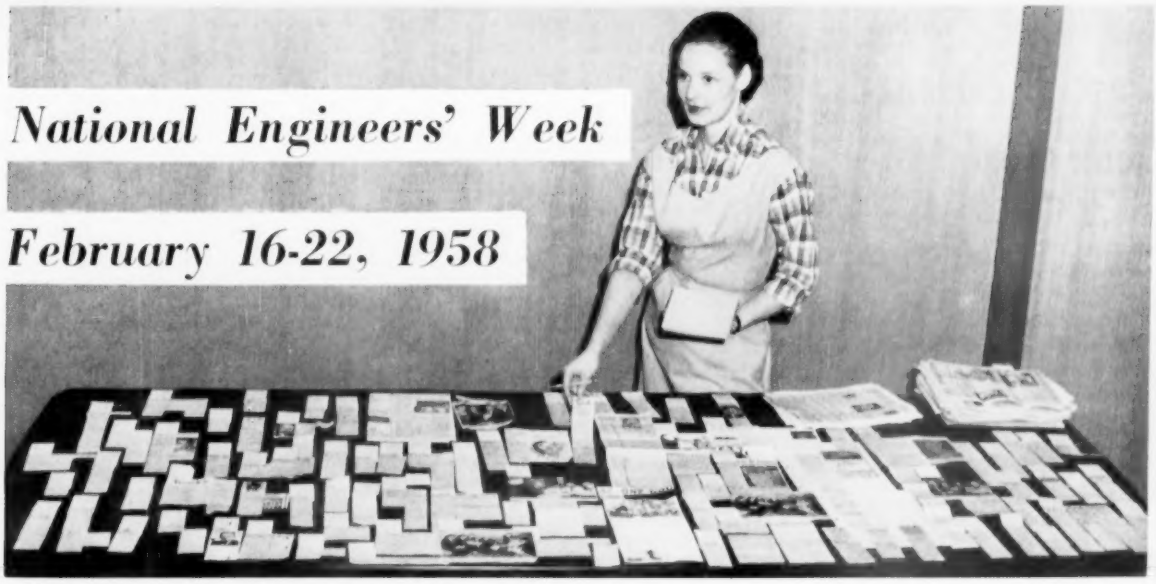
There has been a considerable amount of writing and literature concerning our basic educational system which is beyond the scope of this paper. Admiral Rickover's excellent article titled "Educating Our Talented Children" in the AMERICAN ENGINEER presents a challenging proposal for the revision of our educational system. Special recognition of and training for talented children is a worth-while goal which has been recognized to some extent in a limited number of scholarships for scholastic achievement. However, a more immediate problem is the overcrowded and undermanned high schools in some of our expanding metropolitan areas. Limited facilities for academic pursuits, reduced hours and inadequate teaching staffs all contribute to less than maximum utilization of these years in thorough preparation for pursuit of an engineering education. It is questioned whether the potential engineer receives at this stage the proper perspective concerning the various branches of engineering and the importance of the engineer effort within the Federal Government organization in planning, research development and construction.

A high school graduate can begin training in engineering by temporary summer employment with most of the Federal agencies. Appointments are made at the GS-2 level, which pays about $3,000 per annum, subject to the following conditions:

1. The applicant must qualify in a written civil service test consisting of table reading, perception of form, abstract reasoning and algebra. About 3½ hours is required for the test.

2. He must be graduated from an accredited high school and enrolled or accepted for enrollment to an accredited college or university in a curricu-

(*Continued on page 11*)




**NSPE staff secretary checks over some of the several thousand newspaper and magazine clippings on the 1957 National Engineers' Week. The clippings are being used at NSPE headquarters in the preparation of promotional materials for the 1958 Week, February 16-22. Promotional kits for the 1958 observance will be distributed to state societies and local chapters in mid-October.**

# Nation's Leading Engineers to Sponsor Engineers' Week

FOURTEEN outstanding engineering figures in industry, government, private practice, education, and the military services have been invited to participate as sponsors of the 1958 National Engineers' Week observance, February 16-22.

As this issue of the AMERICAN ENGINEER goes to press, twelve of the fourteen have indicated their interest in participating as sponsors. The others are expected to join in the sponsorship by the end of this month.

The sponsors to date are: Allen B. DuMont, chairman of the board, Allen B. DuMont Laboratories; James R. Killian, Jr., president, Massachusetts Institute of Technology; Royal W. Sorensen, California Institute of Technology; Phillip Sporn, president, American Gas and Electric Company; David B. Steinman, consulting engineer; Robert E. Wilson, chairman of the board, Standard Oil Company of Indiana; Thomas E. Murray, consultant, Joint Committee on Atomic Energy; Major General Emerson C. Itschner, chief of engineers, United States Army; Bertram D. Tallamy, Federal Highway Administrator; Rear Admiral H. G. Rickover, chief of naval reactors, United States Atomic Energy Commission; Clarence H. Linder, vice president, General Electric Company, and Charles Allen Thomas, president, Monsanto Chemical Company.

Mailings on sponsors' letterheads will be made to a list of publishers of daily newspapers and to a list of industrial executives. These letters will describe the objectives of National Engineers' Week, and offer the cooperation of NSPE in making available promotional materials for the Week.

The theme for the 1958 Week is "Engineering Builds Broader Horizons." Promotional kits containing materials based on this theme will be distributed by the National Society to all state societies and local chapters. The kits will be mailed in mid-October, and will be divided into sections containing materials on publicity, radio and TV, Engineers' Week speakers, and special projects.

Lapel buttons carrying the 1958 Engineers' Week poster design will be offered for the first time this year through the National Society. The buttons will be available to state societies and local chapters in various price brackets, depending on the quantity ordered. Sale of the buttons to engineers in local areas should result in considerable fund raising by state societies and local chapters.

A selection of other promotional aids for the Week will be offered by the National Society. These aids will include 15-minute tape recorded programs for radio, five one-minute TV films to be used as "spot announcements" on public service broadcast time, illustrated slides for TV, printed posters and banners, logotypes of the poster design, and newspaper feature articles.

An order form describing all the materials available and listing prices will be distributed to state societies and local chapters in October. Engineers' Week committee chairmen are urged to place their orders as early as possible.

A 12-page booklet outlining the ways industry can participate in the events of the Week will be distributed by the National Society in November. The attractively printed booklet will be designed to give the engineering executive specific details on how his department and firm can cooperate with local engineering societies in de-

*(Continued on page 49)*

# National Society Past President John Riedel Dies

JOHN Charles Riedel, 84, who served as president of the National Society in 1940, died recently at his home in Brooklyn, N. Y.

Retired as chief engineer of the Board of Estimate in New York City the day after his eightieth birthday, Mr. Riedel had been eligible for retirement for many years but chose to

**John C. Riedel**

remain active. He served under all thirteen mayors of Greater New York.

Mr. Riedel was born in New York City. He attended City College, New York University and Cooper Union, receiving a Bachelor of Science degree at the latter school in 1898 and a Bachelor of Engineering degree in 1904. He remained to lecture at Cooper Union and was a special lecturer in engineering economics at Brooklyn Polytechnic Institute.

In 1934, he became deputy chief engineer of the Board of Estimate and from 1939 until his retirement in 1952 he was chief engineer.

When he was seventy-six, he became chairman of the City Traffic Commission. Following his retirement he became a member of the Brooklyn Advisory Planning Board.

Extremely active in engineering organizations, he was also a past president of the New York State SPE and the Kings County Chapter of the NYSSPE.

Mr. Riedel is survived by his widow, Mrs. Rebecca Allen Riedel; three sons, Charles A. Riedel, chief engineer of the Bureau of Highways and Sewers of the Borough of Brooklyn; Robert L. Riedel; and J. Stuart Riedel; and eight grandchildren.

# Functional Section Report Presented at Dallas Meet

**The report of the Functional Section for Consulting Engineers in Private Practice, given at the annual meeting in June, was not available when the AMERICAN ENGINEER carried the reports in the July issue. It follows:**

Herewith are the required minutes of our Section Executive Committee meetings throughout the year, and a copy has been filed with the Washington office. We wish to report to you on our progress and actions. This Functional Section is the guinea pig for parallel sections for other phases of professional activity. A number of projects have been undertaken this year. Task Force No. 1 (in order to avoid confusion with NSPE committees, we have designated them as "task forces") drew up the rules of government, which you approved last fall at the Greenbrier meeting. Task Force No. 2 was appointed to collect and compile fee schedules throughout the several states. That is a continuing process. You have with your October, 1956, meeting minutes a copy of their report showing information as it appeared at that time. Since then, considerable work has been done. However, no further report is available for presentation since a number of the state societies are modifying their fee schedules and terminology therein at their annual meetings.

Task Force No. 3 is making a study and compilation of the practical applications of ethical practices within our several state societies in order that we may seek both knowledge and action which will tend to place everyone on a uniform plane. This will better enable us to understand each other. We who practice in many states may then proceed with a higher degree of knowledge and, consequently, more effectively.

Task Force No. 4 studied and brought to culmination the previous efforts of the National Society regarding professional liability insurance. You will recall that at the Charleston meeting (February, 1957) you approved a professional liability insurance policy utilizing a policy offered by the Continental Casualty Co., with the agent of record as Victor O. Schinnerer & Company, of Washington, D. C. A letter dated May 28, 1957, from Mr. Schinnerer of that company advises that in the approximate sixty-day period since the initial offering of the policy there had been 105 applications received with eighteen of them culminating in policies written. In addition seventy-three inquiries were in process at that time. This is favorable progress.

The first opportunity the Section has had to present an annual sectional meeting program is at this meeting. You will recall that a panel of six persons (three principals, three employees) discussed the general subject of the "Young Engineer in Private Practice." They covered a broad range of subjects including professional opportunities, working conditions, economic problems and unionism. Many of you were present during their panel discussion. Probably you share the opinion that the panel program was excellent and made a very fine foundation for future work. It brought to light many facets of the practice of consulting engineering and the manifold opportunities for responsibility on the part of both the young engineer and employer. The panelists are to be congratulated on their presentations. The following panelists represented the employer viewpoint: C. D. Williams, Patchen and Zimmerman, Augusta, Georgia; Alex Van Praag, Jr., Warren & Van Praag, Inc., Decatur, Ill.; and Alfred J. Ryan, Alfred J. Ryan & Associates, Denver, Colo. The employee viewpoint was presented by Allan Curry, Max A. Mehlburger, consulting engineer, Little Rock, Ark.; Tom Lowe, Jr., Michael Baker, Jr., Inc., Jackson, Miss.; and John A. McFee, C. Warren Bogan & Associates, Washington, D. C. It was a cooperative venture for two of your committees, the Engineering Practices Committee (Leslie Gates, P. E., chairman) and the Subcommittee for Engineers in the Employ of Private Practitioners (Linas Brown, P. E., chairman). Harvey Pierce, P. E., of the Section has been in charge of the program.

In the afternoon session there was a business meeting which included a very intense discussion of business problems of consulting engineers in private practice.

Following the discussion on the business of consulting engineering, the Nominating Committee for the Section made its report. Thereupon the Section elected the following officers for the coming year: A. C. Kirkwood—Chairman; Harvey Pierce—Vice Chairman, Southeastern Area; P. W. Genovese—Vice Chairman, Northeastern Area;

*(Continued on page 37)*

**Professional Engineers of Colorado**—1957 Annual Meeting, September 27, 1957, Columbine Country Club, Denver.

**Wisconsin Society of Professional Engineers**—Summer Conference, September 20-22, 1957, Kings Gateway Inn, Land O Lakes, Wisconsin.

**Virginia Society of Professional Engineers**—Annual Meeting, October 10-12, 1957, Roanoke Hotel, Roanoke, Virginia.

**Washington Society of Professional Engineers**—Annual Meeting, October 11-12, 1957, Benjamin Franklin Hotel, Seattle, Washington.

**NSPE Fall Meeting**—October 17-19, 1957, Grand Pacific Hotel, Bismarck, North Dakota.

**North Dakota Society of Professional Engineers**—Annual Meeting, October 19, 1957, Grand Pacific Hotel, Bismarck, North Dakota.

**West Virginia Society of Professional Engineers**—Annual Meeting, October 25-26, 1957, The Frederick Hotel, Huntington, West Virginia.

The world-famous St. Louis Municipal Opera, America's oldest and best known open air musical theatre, located in Forest Park, will undoubtedly attract many NSPE members during the 1958 meeting. It annually brings thousands of visitors to St. Louis. With a seating capacity of 12,000, every patron can see and hear the action perfectly no matter where they are located. The theatre stages the best available talent from stage, screen, opera, television, and radio.

*Reserve Exhibit Space . . .*

# Early Plans Announced for 1958 Annual Meeting in St. Louis, Mo.

PLANS are already being formulated for the National Society's 1958 annual meeting to be held in St. Louis, Mo., June 11-14, according to word received from E. W. Butler, general chairman for the affair.

Figuring prominently in the twenty-fourth annual meeting will be a new exhibit hall, which offers exhibitors the latest in modern facilities to display new products and ideas to the large segment of NSPE members expected to attend. Exhibitors are urged to reserve space early.

Chairman Butler suggests that members arrange their vacations to coincide with the meeting dates in order to have sufficient time to tour St. Louis, Missouri's largest city and the nation's eighth largest. Known as the "Gateway to the West," St. Louis offers much for the sight-seer.

Chairman Butler stated that special arrangements for families are being made, including a boat excursion on the Mississippi River, plus visits to the St. Louis Zoo, and the St. Louis Municipal Opera, America's oldest and best known summer open air musical theatre.

Headquarters for the session will be the Chase-Park Plaza which boasts a swimming pool for the aqua-minded. There is also golfing facilities within walking distance of the hotel, Mr. Butler reports.

Serving on the Executive Committee for the 1958 meeting with Mr. Butler are O. J. Ruel, secretary; A. A. Kaspar, in charge of exhibits; H. W. Honefenger, president of the Missouri SPE, and Paul N. Doll, executive director of the Missouri SPE.

Mrs. E. W. Butler, wife of the general chairman, is heading the Ladies' Committee.

A boat excursion on the luxurious S.S. Admiral is planned for Society members and their families while attending the annual meeting, June 11-14. St. Louis is the hub of the fabulous Ole Man River which today is a busy artery of intra- and inter-national trade on a vastly greater scale than during the days of the picturesque steamboats. The Admiral is air-conditioned, complete with dance hall, cocktail lounge, restaurant, and has five decks.

# *N.S.P.E. Believes*

# ENGINEER-MANAGEMENT COMMUNICATIONS

**BY PAUL H. ROBBINS, P.E.**

***Executive Director***

**N.S.P.E.**


IT IS WELL KNOWN to members of NSPE that several surveys conducted by the Society have shown one of the paramount areas to which both management and professional employees need to direct their attention is in the area of communications. Much is being said these days on the subject, and every busy person knows the degree to which he is barraged through all types of media to put into his mind the particular topic or item the sponsors wish him to consider.

In addition to the essential communications by which he broadens his technical knowledge, there are two primary areas of communication of deep interest to the professional engineer. One is within his particular sphere of employment by which he becomes better informed of the objectives of the organization for which he works and the information about his employer needed for him to make sound engineering decisions. This area is of equal importance to management as well as to the engineer, and management is becoming ever more aware of the importance of this aspect of administration and the need for specific attention to its mechanism for up and down transmission of information.

There is need, however, for horizontal communication between engineers. It is rather obvious that one content is the exchange of technical knowledge, but equally important is the ability of engineers to exchange among themselves the questions and queries concerning the work of each other in order that they may better know the role they are to fulfill in the organization as a whole and to mutually advance the engineering profession.

There are numerous ways in which this can be accomplished. Alert management is recognizing the need for providing not only the usual mechanisms of supervisor-employee communications, but the responsibility for company-sponsored conferences, opportunity to participate in society affairs, and sometimes even primarily social events for engineers and oftentimes their families.

The fact that a need for an exchange of information of this type has cropped up frequently in the comments of engineers, has caused the NSPE Committee on Employment Practices to suggest that here is an area in which the professional society can serve. It can serve not only the professional engineers which compose its membership but the users of engineering services through which the skill and knowledge of the individual engineer is used for the betterment of mankind. The resulting policy statement on this topic presented by the Employment Practices Committee and adopted by the Society at the Dallas meeting has caused wide-spread interest. This policy statement is as follows:

The National Society of Professional Engineers has engaged in, and is continuing, detailed and careful studies of the employment conditions of engineers. It has conducted research into the general problems and a number of specific case histories of professional employee-employer relationships. Various publications of the Society, such as, "A Professional Look at the Engineer in Industry," "Criteria for Professional Employment of Engineers," the Executive Research Survey Reports, etc., provide helpful background information and specific suggestions for improved engineer-management relationships.

To make further progress along these lines, the Society suggests that professional engineers and management take advantage of the information and services available from the National Society and its state societies and local chapters. The local elements of the National Society of Professional Engineers can provide direct assistance to management and the professional engineers, through conferences, providing information, aiding in securing the registration of qualified engineers and other means.

Studies have shown that an essential element of good engineer-management relations is the necessity for adequate horizontal, as well as vertical, communication between engineers at all levels of professional assignment. It is the responsibility of engineers and management to provide an adequate mechanism for exchange of information and ideas and suggestions for mutual discussion and action. This may take the form of frequent company-sponsored conferences, engineers' clubs, an independent organization of the engineering personnel, including those in supervisory positions, or a functional section of the local chapter of the professional society.

It is the policy of the National Society of Professional Engineers to invite all interested companies and professional engineers to use the facilities of NSPE at its three levels of operation to make continued progress in the development of professional attitudes and practices.

Adopted by NSPE Board of Directors, June, 1957. ***End.***

# *With Our Members . . .*

*Many Exhibits*

## Joint Virginia SPE-AIA Fall Convention Scheduled for Roanoke, Va., Oct. 10-12

Plans are well under way for the joint Virginia Society of Professional Engineers and American Institute of Architects convention to be held at the Hotel Roanoke, Roanoke, Va., Thursday night, Friday and Saturday, October 10 to 12. The convention will start with informal committee meetings late Thursday afternoon. Official registration will start Thursday evening.

Technical sessions will be held Friday and Saturday in both mornings and afternoons. Arrangements for these sessions are still being formulated; however, separate sessions will be held by the engineers and architects. A feature of this convention will be the many exhibits expected; ample time will be allotted for visiting them. A break has been scheduled between technical sessions in both mid-morning and mid-afternoon to afford those attending opportunity to visit the exhibit halls. Those who visit all the exhibit booths will be eligible for the door prize drawings.

Arrangements have been completed for several gala social events. On Friday evening the Roanoke Chapters of the VSPE and AIA will be hosts to the entire convention at a cocktail party. New VSPE officers will be installed at a luncheon meeting Saturday. A trip to nearby Blacksburg for the VPI-Villanova football game will highlight the Saturday afternoon program. Saturday evening there is scheduled a cocktail party, banquet and dance jointly with the AIA. Roger Allen, well-known humorist and architect of Grand Rapids, Michigan, will entertain with a dissertation. A special invitation is extended to the ladies of the engineers, architects, and guests for all social functions.

### *Honor President Dyer*

**Friends of NSPE President Garvin H. Dyer, recently presented him with a scroll of about 200 signatures, honoring him as Missouri's first president of the National Society of Professional Engineers. Signatures on the scroll were of people who attended the twenty-first annual MSPE meeting late in June. Presentation of the document occurred during a luncheon meeting at the University Club in Kansas City. In attendance were fifteen professional engineers who had been associated closely with Mr. Dyer in the Ozark Chapter of MSPE, Western Chapter of MSPE, and in the Missouri Society. Mr. Dyer had served as president of each of these three organizations. The scroll was presented by A. C. Kirkwood, immediate past president, MSPE. Paul N. Doll, executive director, MSPE was absent at time photo was taken. Attending the luncheon were, standing, l. to r.: C. Y. Thomas, past vice president NSPE and past president, Kansas Engineering Society; William M. Spann, past president, Western Chapter, MSPE; William E. Hedges, past president, Ozark Chapter, MSPE; Ben T. Marshall, past president, Western Chapter, MSPE; C. G. Roush, past vice president NSPE and past president, MSPE; R. E. Piner, director, Ozark Chapter, MSPE; S. H. Pollock, past president, Western Chapter, MSPE; and Arlow V. Ferry, past president, Western Chapter, MSPE and director, NSPE. Seated, l. to r.: M. J. Horney, past president, Western Chapter, MSPE; J. P. Kessler, president, Western Chapter, MSPE; A. C. Kirkwood, past president, MSPE and past president Western Chapter, MSPE; Garvin H. Dyer, president, NSPE and past president, MSPE, past president, Western Chapter, past president, Ozark Chapter; R. E. Welsh, past president, Western Chapter, MSPE; S. J. Callahan, chairman, Consulting Engineers Section, Western Chapter, MSPE; and C. Myron Lytle, past president, MSPE and past president, Western Chapter, MSPE.**

By Mrs. Harry G. Kennedy, Chairman of the Ladies Auxiliary Advisory Committee.

**How many states are 100 per** cent in auxiliaries? This chairman knows of only one—South Carolina, with four chapters and four auxiliaries. South Carolina met as a state auxiliary for the first time in Charleston, June 29, during the meeting of SCSPE. Mrs. R. K. Rouse, Southeastern area chairman, reported a most successful meeting with much fun in historic sightseeing by bus and by boat.

**The Spartanburg Auxiliary** was organized in June, electing the following to office: President, Mrs. F. M. McCormick; Vice President, Mrs. Frank W. Mahon; Secretary, Mrs. A. W. Schoolbred; Treasurer, Mrs. Dorcy Harris, Jr.

**Mrs. H. P. Derry, of Albany,** Ga., is the state director for the ladies' auxiliaries. She has set a goal of three new auxiliaries by June, 1958, to be added to Georgia's now existing four. Approximately seventy-five wives of GSPE were entertained with a summer luncheon at the Augusta Country Club.

**The Charleston, W. Va., Auxiliary** sponsored a "cookout supper" for the chapter members and their families on August 21. Another capability of the engineer was proven—he can grill delicious hamburgers.

**The Weirton Auxiliary, Weir**ton, W. Va., has ended a year's program of *facts, fun, and fellowship.* The speakers have been from the industries of the Ohio Valley. There have been combined meetings with their Chapter and with auxiliaries from the surrounding areas.

***Engineers Wives*—1957 issue,** edited by Mrs. Warner Howe, past chairman of Auxiliaries Committee, has been mailed to all local presidents. Copies for distribution are available from the NSPE office. Please write for the number you need for your group.

# PROFESSIONAL DIRECTORY

### PALMER AND BAKER ENGINEERS, INC.
**Consulting Engineers — Architects**

Surveys, Reports, Design, Supervision, Consultation, Traffic Problems, Tunnels, Bridges, Highways, Airports, Industrial Buildings, Waterfront & Harbor Structures, Complete Soils, Materials & Chemical Laboratories

**Mobile, Ala. New Orleans, La.**
**Washington, D. C.**

### KAISER ENGINEERS

Division of Henry J. Kaiser Company

**ENGINEERS — CONTRACTORS**

**1924 Broadway, Oakland 12, California**

### HALWYN R. SMITH
**Consulting Engineer**

Industrial—Chemical—General
Plant Layout and Location, Engineering and Economic Reports, Investigations and Surveys, Industrial Wastes Problems, Technical Writing

**6059 Hamilton Drive, Riverside, California**
**OVerland 4-2529**

### BROCKWAY, WEBER & BROCKWAY, INC.

George S. Brockway Roy E. Weber
George R. Brockway

Staff
H. L. Fitzgerald T. A. Clark H. E. Whittington
R. E. Owen John Adair, Jr.
C. A. Anderson T. R. Demery

Civil, Structural, Sanitary, Municipal, Electrical

**West Palm Beach, Florida**

### SOUTH FLORIDA TEST SERVICE
**Testing—Inspection—Research—Engineers**

Consultants and specialists in corrosion, weathering and sunlight testing.

**4201 N.W. 7th Street Miami 34, Florida**

Member A. C. I. L.

### LAW—BARROW—AGEE LABORATORIES, INC.

Foundation Investigations

Physical & Chemical Testing

**Main Laboratories: Atlanta, Ga.**
**Charlotte, N. C., Albany, Ga., Tampa, Fla.**

### MERRITT & WELKER
**Engineers**

Water Systems Natural Gas Systems
Sewer Systems Streets & Roads

**Marietta, Georgia**

### ROBERT AND COMPANY ASSOCIATES
**Consulting and Designing Engineers**

Industrial Plants—Municipal, Highway and Airport Improvements — Power Plants — Water Supply — Sewage and Industrial Waste Disposal — Appraisals — Reports.

**Atlanta Georgia**

### HOMER L. CHASTAIN & ASSOCIATES
**Consulting Engineers**

Civil, Structural, Mechanical, Industrial Design & Supervision, Construction Engineering, Turnpikes, Bridges, Water Supply, Sewerage, Flood Control & Drainage, Material Controls, Municipal Engineering, Topographic Surveys

**155½ West Main Street Decatur, Illinois**

### CONSOER, TOWNSEND and ASSOCIATES

Water Supply, Sewerage, Flood Control and Drainage, Bridges, Express Highways, Paving, Power Plant, Appraisals, Reports, Traffic Studies, Airports Gas & Electric Transmission Lines

**360 East Grand Avenue, Chicago 11, Illinois**
**9½ N. Indiana St., Greencastle, Ind.**

### CRESCENT ENGINEERING COMPANY, INC.
**Contracting & Consulting Electrical Engineers**

Design, Supervision and Construction Process Power and Lighting for Industrial Plants

**6455 S. Central Avenue, Chicago 38, Illinois**

### DE LEUW, CATHER & COMPANY
**Consulting Engineers**

Public Transit Subways
Traffic & Parking Railroad Facilities
Expressways Industrial Plants
Grade Separations Municipal Works
Urban Renewal Port Development

**150 North Wacker Drive, Chicago 6, Ill.**
**San Francisco Toronto Oklahoma City**

### PLUMB, TUCKETT, & PIKARSKY
**Consulting Engineers—Architects**

Railroad & Highway Bridges
Industrial & Commercial Buildings

**2649 Wabash Avenue Gary 3, Indiana**
**25 E. Jackson Blvd. Chicago 4, Illinois**

### SARGENT & LUNDY
**Engineers**

Steam and electric power plants for Utilities and Industrials
Design • Supervision
Studies • Reports

**140 South Dearborn Street**
**Chicago 3, Illinois**
**FRanklin 2-7130**

### SOIL TESTING SERVICES, INC.
**Consulting Engineers**

Soil Investigation—Laboratory Testing
Engineering Reports and Recommendations

**3521 N. Cicero Avenue, Chicago 41, Illinois**
**Milwaukee; Portland, Michigan; San Francisco; Kenilworth, N. J.; Havana, Cuba**

### STANLEY ENGINEERING COMPANY
**Consulting Engineers**

**Hershey Building 208 S. LaSalle St.**
**Muscatine, Iowa Chicago 4, Illinois**

### WIGHT AND COMPANY
**Consulting Engineers**

Bridges, Express Highways, Paving, Water Systems, Sewage and Waste Disposal, Flood Control and Drainage, Airports and Buildings, Site Planning, Reports.

**1038 Curtiss St., Downers Grove, Ill.**
**301 E. Main St., Barrington, Ill.**

### CHAS. W. COLE & SON
**Engineers — Architects**

**South Bend, Indiana**

### WILSON & COMPANY
**ENGINEERS**

**Salina, Kansas**
**Albuquerque, New Mexico**
**Denver, Colorado**

### EUSTIS ENGINEERING COMPANY
FOUNDATION AND SOIL MECHANICS INVESTIGATIONS

Soil Borings Laboratory Tests
Foundation Analyses Reports

**3635 Airline Highway**
**Metairie, Louisiana**

### WHITMAN, REQUARDT & ASSOCIATES
**Engineers — Consultants**

Civil—Sanitary—Structural
Mechanical—Electrical

Reports, Plans Supervision, Appraisals

**1304 St. Paul Street, Baltimore 2, Maryland**

### FAY, SPOFFORD & THORNDIKE, INC.
**Engineers**

Airports Bridges Turnpikes
Water Supply, Sewerage, Drainage
Port and Terminal Works, Industrial Bldgs.

Investigations Reports Designs
Supervision of Construction

**Boston, Massachusetts**

### METCALF & EDDY
**Engineers**

Water, Sewage, Drainage, Refuse and Industrial Wastes Problems
Airports Valuations
Laboratory

**Statler Building Boston 16, Mass.**

### COMMONWEALTH ASSOCIATES INC.
**Consulting and Design Engineers**

Power Generation
Electric—Gas—Water Systems
Industrial Planning

**209 E. Washington Ave., Jackson, Michigan**

### EUGENE K. FALLS
**Consulting Engineer**

PRESSURE RELIEVING SYSTEMS
Process Industries, Utilities
Manufacturing, Commercial, Residential
SAFETY VALVES • RELIEF VALVES
Consultation, Development
Design of Test Facilities,
Performance Tests, Modernization,
Special Applications

**4445 North River Road, Port Huron, Mich.**

### THE HINCHMAN CORPORATION
**Consulting Engineers**

CORROSION CONTROL
Survey—Designs—Specifications
Evaluations

**Francis Palms Building**
**Detroit 1, Michigan**

### BLACK & VEATCH
**Consulting Engineers**

Water—Sewage—Electricity—Industry
Reports, Design
Supervision of Construction
Investigations, Validation and Rates

**1500 Meadow Lake Parkway**
**Kansas City 14, Missouri**

# PROFESSIONAL DIRECTORY

**BURNS & McDONNELL**

Engineers—Architects—Consultants

P.O. Box 7088 Kansas City, Mo.

Telephone DElmar 3-4375

**A. C. KIRKWOOD & ASSOCIATES**

ENGINEERS
CONSULTANTS

7800 The Paseo
Kansas City 10, Mo.

**RUSSELL & AXON**

Consulting Engineers

Civil — Sanitary — Structural
Industrial — Electrical
Rate Investigations

408 Olive St., St. Louis 2, Mo.
Municipal Airport, Daytona Beach, Fla.

**SVERDRUP & PARCEL, INC.**

Engineers—Architects

Bridges—Structures—Highways
Industrial and Power Plant
Engineering

915 Olive Street, St. Louis 1, Mo.
417 Montgomery St., San Francisco, Calif.

**FRANK E. HARLEY AND ASSOCIATES**

Water Works, Sewage, Municipal Highways

Harley Building
860 Godwin Avenue Wyckoff, N. J.

**AMMANN & WHITNEY**

Consulting Engineers

Design and Supervision of Construction of Bridges, Highways, Expressways, Buildings, Special Structures, Airport Facilities

111 Eighth Avenue, New York 11, N. Y.
724 E. Mason Street, Milwaukee 2, Wisc.

**ANDREWS & CLARK**

Consulting Engineers

305 East 63rd Street

New York 21, N. Y.

**BROWN & BLAUVELT**

Industrial Plants, Bridges, Dams, Airports, Expressways, Parkways, Highways, Preliminary Reports, Engineering Design, Construction Supervision, Material Controls and Testing, Municipal Engineering Services, Tax Maps, Surveying

468 Fourth Avenue New York 16, N. Y.

**BURNS and ROE, Inc.**

Engineering and Design — Reports — Surveys — Construction — Electric, Steam, Hydro Plants—Transmission—Distribution Aeronautical Facilities — Research and Development—Nuclear, Chemical, Process, and Industrial Plants

160 West Broadway New York 13, N. Y.

**FOSTER & CAFARELLI**

Engineers

Port Development, Shipyards, Drydocks, Power Plants, Distribution Systems, Industrial Plants, Commercial Buildings, Surveys, Reports, Estimates, Design, Supervision, Consultation

44 Whitehall Street, New York 4, New York

**HENRY J. CAMPBELL, JR.**

CONSULTING ENGINEER

Heating—Ventilating—Air Conditioning
Electrical and Sanitation
Design—Reports—Consultation

288 Old Country Road, Suite 14
Mineola, L. I., N. Y.

**HARDESTY & HANOVER**

Consulting Engineers

Bridges—Long Spans of All Types
Movable—Lift, Bascule and Swing
Hanover Skew Bascule, Steel and Concrete Spans
Grade Crossing Eliminations
Expressways and Thruways
Other Structures, Foundations
Supervision, Reports, Appraisals

101 Park Avenue New York 17, N. Y.

*Restricted to Registered Professional Engineers . . . Directory Continued on Next Page*

## Functional

*(Continued from page 32)*

Leslie C. Gates—Vice Chairman, Central Area; H. R. Veenstra—Vice Chairman, North Central Area; M. D. Turner—Vice Chairman, Southwestern Area; Kendall M. Wood—Vice Chairman, Western Area, and Frank E. Sanford—Secretary.

Retiring with the thanks of the Committee, and we believe the Board, in recognition of their efforts on behalf of this Section are: Vice Chairmen W. H. Austin, Connecticut; Elmer Barrett, Ohio; George West, Houston; and Secretary Harold Trester, Wisconsin.

Financially, the Section has utilized, with the agreement of the Executive Committee of the Society, the funds made available to the Engineering Practices Committee. Task forces and officers have also utilized a normal donation of office expenses from pockets of the several section officers and task force members. The Section recognizes the major assistance received from the Washington office.

Out of the Section Executive Committee and Section annual meeting deliberations come a number of considerations which are now brought to you for your consideration and action.

ACTIONS TO BE CONSIDERED:

1) The recommendation of the Registration Committee as presented at this meeting and the consequent action of the Board with reference to the dissemination of the proposed Ideal Registration Law and proposed revised Model Law were both in accordance with the desires of the Section.

2) The Section requests continued cooperation with Engineers Joint Council in the preparation of a "Manual of Consulting Practice for Consulting Engineers." Request is made that the National Society of Professional Engineers appear as one of the several organizations sponsoring this manual.

3) *Jenkins-Keogh Bill*—President Rhinehart appointed Carl Vogt, P. E., to represent the Society at the American Thrift Assembly, with instructions to report back to the Society through the Engineering Practices Committee and this Section. Board members have received a brochure put out by the American Thrift Assembly. Inside that brochure are to be found a listing of the several organizations composing the assembly. It is impossible for a group of organizations to sponsor and promote legislation without some financial assistance. This Functional Section in annual meeting has adopted its Executive Committee recommendation as follows:

In accordance with provisions of Bylaw 22, the Functional Section for Engineers in Private Practice requests the Board of Directors to approve the following:

1) Advance $1,500 of NSPE funds to the Functional Section to meet an urgent need for immediate financial support of the American Thrift Assembly and other supporting action by NSPE to promote the Jenkins-Keogh Bill;

2) Recognizing current fiscal year budget limitations, authorize the solicitation of additional funds from consulting engineers for the purpose of supporting and securing legisaltion as set forth in NSPE Policy No. 39;

3) Authorize the Functional Section for Engineers in Private Practice to establish and maintain an "NSPE Consulting Engineers Fund" for this purpose, the funds collected to be under the custody of the NSPE treasurer and to be disbursed by him at the direction of the Functional Section Executive Committee.

4) *Committee Structure Study Committee*—In the contemplated Committee Structure Study report, the Committee to be designated as the "Functional Section Committee" is apparently intended to be a supervisory committee. It is recommended that the "Functional Section Committee" be deleted in its entirety from the Committee Structure Study, thus bringing the several functional sections directly under the National Executive Committee.

**This report was presented orally by A. C. Kirkwood, chairman of the Functional Section.**

### *Forged Checks*

The Federal Bureau of Investigation has notified the Missouri SPE that printed forged checks on the account of the "Missouri Engineering Society" are in circulation. The Missouri SPE has testified that they have no knowledge of such an organization in the State. It is not an NSPE affiliate. Anyone knowing of such an organization is asked to contact Paul N. Doll, executive director of the Missouri SPE.

# PROFESSIONAL DIRECTORY

Alphabetized by States . . .
New York-Ohio

### FREDERIC R. HARRIS, INC.
**Consulting Engineers**

*Economic surveys and reports*
*Engineering investigations and reports*
Design and supervision of construction
Port and Harbor Facilities • Highways, expressways and bridges • Power and Industrial plants • Airport Facilities

27 William St. — New York 5, N. Y.
1915 Tulane Ave. — New Orleans, La.

### HOWARD, NEEDLES, TAMMEN & BERGENDOFF
**Consulting Engineers**

Bridges, Structures, Foundations
Express Highways
Administration Services

1315 Grand Avenue — Kansas City 8, Mo.
55 Liberty Street — New York 5, N. Y.

### MADIGAN-HYLAND
**Consulting Engineers**

28-04 41st Avenue

Long Island City, New York

### GEORGE STANLEY MARSHALL ASSOCIATES
**Consulting Engineers**

Investigation Design Supervision
Petro-Chemical Industries
Industrial Facilities Power Plants
Civil Mechanical Electrical

ONE PARK ROW — NEW YORK 38, N. Y.

### MORAN, PROCTOR, MUESER & RUTLEDGE
**Consulting Engineers**

Foundations for Buildings, Bridges and Dams; Tunnels, Bulkheads, Marine Structures; Soil Studies and Tests; Reports, design and supervision.

415 Madison Ave., New York 17, N. Y.
Eldorado 5-4800

### THE C. W. NOFSINGER CO.
**Engineers & Contractors**

906 Grand Ave. — BA 1-4146

Kansas City 6, Mo.

### JAMES P. O'DONNELL
**Engineers**

Professional Engineering for the Petroleum and Process Industries

39 Broadway — New York 6, N. Y.
Bowie Building — Beaumont, Texas

### PARSONS, BRINCKERHOFF, HALL & MACDONALD
**Engineers**

Bridges, Highways, Tunnels, Airports, Subways, Harbor Works, Dams, Canals, Traffic, Parking and Transportation Reports, Power, Industrial Buildings, Housing, Sewerage and Water Supply.

51 Broadway, New York 6, N. Y.

### PRAEGER-KAVANAGH
**Engineers**

136 East 38th St. — New York 16, N. Y.

### SEELYE STEVENSON VALUE & KNECHT
**Consulting Engineers**
**Richard E. Dougherty, Consultant**

Airports, Highways, Bridges, Dams, Water Supply, Sanitation, Tunnels, Industrial Plants, Concrete, Steel, Industrial Waste Disposal, Foundations, Soil Studies.
Civil—Mechanical—Electrical

101 Park Avenue — New York 17, N. Y.

### SINGSTAD & BAILLIE
**Consulting Engineers**

Ole Singstad — David G. Baillie, Jr.
Tunnels, Subways, Highways, Foundations, Parking Garages, Investigations, Reports, Design Specifications, Supervision

24 State St. — New York 4, N. Y.

### D. B. STEINMAN
**Consulting Engineer**

HIGHWAYS — **BRIDGES** — STRUCTURES
Design — Construction — Investigations
Strengthening — Reports — Advisory Service

117 Liberty Street — New York 6, N. Y.

### SYSKA & HENNESSY, INC.
**Engineers**

Heating Ventilating Air Conditioning
Electric & Sanitation
Design Reports Consultation

NEW YORK, N. Y.

### PROFESSIONAL ENGINEERS
*Put your Card here*

Keep your name before more than 42,000 readers. It's good business.

### TIPPETTS-ABBETT McCARTHY-STRATTON
**Engineers**

Ports, Harbors, Flood Control, Irrigation Power, Dams, Bridges, Tunnels, Highways Subways, Airports, Traffic, Foundations Water Supply, Sewerage, Reports, Design Supervision, Consultation

62 West 47th Street — New York City

### WATER SERVICE LABORATORIES, INC.
**Chemical Engineers**

Specialists in Water Treatment
Consulting and Technical Services

Main Office: 423 W. 126 St., N. Y. 27, N. Y.
Offices also in: Phila., Wash., & Richmond

New York — Washington — St. Louis — Oklahoma City

### ADAC HE ENGINEERS
The Arcade — Cleveland 14, Ohio

Aircraft Turbo-Jet Laboratories
Minus 100° to Plus 1000°
400° High Temperature Hot Water District Heating

### HARRY BALKE ENGINEERS
**Consulting Engineers**

Consulting Service—Reports, Design, Supervision, Research
Bridges, Buildings, Structures, Toll Roads, Expressways, Highways

2330 Victory Parkway
Cincinnati 6, Ohio

### ELMER S. BARRETT ASSOCIATES
**Consulting Engineers**

Surveys—Design—Inspection
Highways — Municipal
Bridges — Reports
Transmission Lines

249 S. Paint St. — Chillicothe, Ohio
Phone: 3-2287

### E. D. BARSTOW & ASSOCIATES
**E. D. Barstow—T. A. Gilliam**

Water Supply, Sewerage, Highways, Structures, Industrial

163 N. Union Street — Akron 4, Ohio

### GEORGE W. BRANDT, ENGINEER
**Consulting • Design • Mechanical • Development • Fabrication**

Box 101 — West Milton, Ohio

### GUSTAVE M. GOLDSMITH
**Consulting Engineer**

General Structures — Plant Layout
Design—Investigation—Quantity Surveys

1734 Bella Vista — Cincinnati 37, Ohio

### JONES, HENRY & WILLIAMS
**Consulting Sanitary Engineers**

Water Works
Sewerage and Treatment
Waste Disposal

Security Bldg. — Toledo 4, Ohio

### ELMER A. KISH
**Consulting Engineer**

Consulting, design investigations, reports

Williamson Building
Cleveland 14, Ohio

### H. R. RICHARDS—A. V. ALEXEFF & ASSOCIATES
Consulting — Design
Development — Fabrication
Continuous Processing Machinery

INDUSTRIAL OVENS, INC.
13886 Triskett Rd., Cleveland 11, Ohio
Tel. CL-1-4400

### JOHN OSTBORG
**Engineer Designer**

Diesel Engine Design Consultant
Mechanical Engineering & Design Service

34 E. High Street — Springfield, Ohio

### CARL F. SCHOENBAUM
**Consulting Engineer**

Industrial • Design • Development • Research • Economics • Analysis • Supervision of Construction

4319 Bellwood Dr., N. W.
Canton 8, Ohio

# PROFESSIONAL DIRECTORY

Alphabetized by States . . .
Ohio-Pennsylvania

**TOLEDO TESTING LABORATORY**
Engineers and Chemists
Concrete — Soils — Asphalt
Inspection — Tests — Supervision
Consultation — Specifications and Investigation of
Engineering Works and Materials
1810 North 12th St. Toledo 2, Ohio

**VOGT, IVERS, SEAMAN & ASSOCIATES**
Design and supervision of Municipal and Industrial Facilities: Bridges, Highways, Expressways; Buildings, Special Structures, Airports; Diesel, Hydro-Electric, Steam, Power Facilities; City Planning and Reports.
34 West Sixth Street, Cincinnati 2, Ohio
20 North Wacker Drive, Chicago 6, Ill.

**OKLAHOMA TESTING LABORATORIES**
Registered Engineers — Chemists
Oklahoma City, Okla.
Materials Testing and Inspection
Member A. C. I. L.
C. A. Lashbrook, Owner-Director — M. A. Witte, Chief Engineer

**ALBRIGHT & FRIEL, INC.**
CONSULTING ENGINEERS
Water, Sewage, Industrial Wastes and Incineration Problems, City Planning, Highways, Bridges and Airports, Dams, Flood Control, Industrial Buildings, Investigations, Reports, Appraisals and Rates
Three Penn Center Plaza
Philadelphia 2, Pa.

**MICHAEL BAKER, JR., INC.**
Consulting Engineers
Highways, Airports, Waterworks, Sewers, Sewage Treatment, City Planning, Surveys, Photogrammetric Mapping
Baker Building—Rochester, Penna.
Branch Offices
Harrisburg, Pa., Jackson, Miss., College Park, Maryland

**PROFESSIONAL ENGINEERS**
*Put your card here*
Keep your name before more than 42,000 readers. It's good business.

**CAPITOL ENGINEERING CORPORATION**
Engineers—Constructors—Management
Design and Surveys, Roads and Streets, Sewer Systems, Water Works, Planning, Airports, Bridges, Turnpikes, Dams
Executive Offices: Dillsburg, Pennsylvania
Washington, D. C. — Pittsburgh, Pa.
Dallas, Texas — Paris, France

**FRAZIER-SIMPLEX, INC.**
CONTRACTING & CONSULTING ENGINEERS
Furnace Engineering for the Glass and Steel Industries
686 East Beau Street, WASHINGTON, PA.
U. S. A.

**GANNETT, FLEMING, CORDDRY & CARPENTER, INC.**
Engineers
Water, Sewage, Roads, Turnpikes, Bridges, Airports, Traffic, Appraisals
HARRISBURG, PA.
Philadelphia, Pa. — Daytona Beach, Fla.
Pittsburgh, Pa. — Medellin, Colombia, S. A.

**GREEN ENGINEERING COMPANY**
Consulting Engineers
Highways, Bridges, Buildings, Industrial Plants
Pittsburgh, Pa.
Philadelphia, Pa. — Baltimore, Md.
Boston, Mass. — Washington, D. C.
Chicago, Ill. — Miami, Florida

**HALL LABORATORIES, INC.**
Consultants on Industrial Water Problems
Boiler Water Conditioning, Cooling Water Treatment, Process and Waste Water Engineering Service
P. O. Box 1346 — Pittsburgh 30, Pa.
(323 Fourth Ave.)

**HARRIS, HENRY, & POTTER, INC.**
Consulting — Design— Reports
Mechanical — Electrical — Civil
Architectural
Spring Valley — R.D. 3, Doylestown, Pa.

*Restricted to Registered Professional Engineers . . . Directory Continued on Next Page*


## Kurtz

(*Continued from page* 20)

After each war, this dynamic environment in which war can generate becomes available again between the two most powerful concentrations of military forces which are within mutual range of each other's capacities for decisive destruction. War between these two nations becomes a live potential.

The matter of range is important. The dynamic interactions of war do not generate between military powers which are beyond the range of each other's capacity to do harm. Wars do not emerge in history between nations which could not hurt each other.

The polarity of two dominant concentrations of national military power is important. These dynamic patterns do not generate between a dominantly powerful nation and a weak neighbor. Although the defensive expansion of the larger nation may overpower the weak neighbor economically, diplomatically, or even militarily, the dynamic forces of major war generate only when the defensive expansion patterns of two powerful military nations come into overlapping conflict.

In modern times each nation's military department has a Planning Agency. This agency has the responsibility to scan the military horizon, constantly, to detect the foreign military power which is becoming the most dangerous potential threat. As this potential enemy is brought into focus, all national foreign policy becomes conditioned towards defensive expansion against this potential enemy.

The foreign policy of each of the two major powers within mutual range, thus, begins to focus upon the potential hazard of the other national military power.

Potential threat is all that is required to spark the dynamics of anxiety behavior.

The dynamic interactions of war can generate as they have in recent years between the U. S. and the U.S.S.R., without either nation's soldiers having killed any citizens in the other country, by military command. It is the increasing potential danger which sparks the national anxiety-behavior.

This whole build-up is a continuing change in the specific environment in which the citizens of a nation exist. The environment becomes increasingly charged with potential danger. Human beings react differently when placed in situations of deep apprehension.

Aroused and intense public anxiety is the vital ingredient required before any nation full of people can be manipulated into going into war. Public anxiety is the secret weapon which motivates people towards the sacrifices, sufferings and disaster of war. Unless public anxiety can be sustained at a high pitch no small clot of political leaders can push a people into war. No matter how compulsively an international communist may dream of increased personal power in foreign lands . . . no matter how compulsively a colonial baron may dream of increased personal power abroad . . . no matter how compulsively an international capitalist may dream of owning all of the oil in the world . . . these dreams are empty personal crises unless they are supported by a well armed people driven involuntarily by intensive anxiety into fighting a "defensive" war against an evil enemy.

To the people on each side of the build-up for war, the

(*Continued on page* 47)

# PROFESSIONAL DIRECTORY

Alphabetized by States . . .
Pennsylvania-West Virginia

## . . . Supplemental Services . . .

**THE KULJIAN CORPORATION**
Engineers • Constructors • Consultants
POWER PLANTS
(Steam, Hydro, Diesel)
Oil Refineries, Pipe Lines • Chemical Plants • Textile Plants • Breweries, Food Processing Plants • Airports • Hangars
Army, Navy Installations
1200 No. Broad St., Philadelphia 21, Pa.

**D. C. LATELLA & ASSOCIATES**
Industrial Engineers—Management Consultants
Don Latella—A. R. Hopf
Supervisor Training — Plant Layout — Labor Relations
Office Procedures—Economic Studies—Wage Incentives
Production Control—Cost Analysis—Waste Reduction
WIDENER BLDG., PHILADELPHIA 7, PA.

**LAWRIE & GREEN & ASSOCIATES**
Architectural and Engineering Offices
321 N. Front Street
Harrisburg, Pennsylvania
Ritchie Lawrie, Jr., P.E., Consulting Engineer

**MODJESKI AND MASTERS**
Consulting Engineers
G. H. Randall, C. W. Hanson, J. R. Glenn, H. J. Hagerd, F. M. Masters
Design and Supervision of Construction
Inspection and Reports
Bridges, Structures and Foundations
300 N. Sixth St., Harrisburg, Pa. — New Orleans, La. Philadelphia, Pa.

**V. C. PATTERSON & ASSOCIATES, INC.**
Engineers
Refrigeration Specialists
Warehouses—Refrigeration & Insulation
Food Freezing—Low Temp. Refrigeration
Patented System for Correction of Frost-heaved Floors
415 W. Market Street — York, Penna.

**PITTSBURGH TESTING LABORATORY**
Testing—Inspection—Analysis
Radiography—Soils Mechanics
Main Office, Pittsburgh, Pa.
32 Laboratories in Principal Cities

**CYRUS WM. RICE & CO., INC.**
Consulting Chemical Engineers
Industrial Water and Waste
16 Noble Avenue, Pittsburgh 5, Penna.

**EMERSON VENABLE**
Chemist and Chemical Engineer
Chemical Analysis
Research — Development
Trouble Shooting
6111 Fifth Ave., Pittsburgh 32, Pa.

**THOMAS E. DUCE ASSOCIATES**
Consulting Engineers
Electrical and Mechanical
Murray Building
1733 S. Brownlee Blvd., Corpus Christi, Tex.

**ENGINEERS TESTING LABORATORY, INC.**
Soil Mechanics and Foundation Engineering
Soil Borings — Laboratory Tests
Foundation Analyses — Reports
2116 Canada Dry St., Houston 23, Texas
444 North 9th Street, Baton Rouge, La.

**FORREST and COTTON**
Consulting Engineers
Regional Water Supplies
Water and Sewage Works
Industrial Development
Airports — Dams
Appraisals — Reports
600 Vaughn Building — Dallas 1, Texas

**FREESE & NICHOLS**
407 Daniger Bldg.
Fort Worth, Texas
**FREESE, NICHOLS & TURNER**
2111 C & I Life Bldg.
Houston, Texas
Consulting Engineers

**LOCKWOOD, ANDREWS & NEWNAM**
Consulting Engineers
Water Works, Sewerage & Sewage Disposal, Public Works, Structures, Earthworks, Mechanical & Electrical.
Reports—Design—Supervision
Surveys—Valuations
Corpus Christi—Houston—Victoria, Texas

**LOUIS J. LUCAS**
Industrial Management Engineer
A Personal Service . . .
In designing, installing and supervising to a successful conclusion, those products, controls, methods, procedures and systems needed in a profitable operation . . .
Since 1925
554 South Summit, Fort Worth, Texas

**H. D. NOTTINGHAM & ASSOCIATES**
Engineers—Architects
Design—Supervision—Buildings
Industrial Plants—Master Planning
Airports—Reports
Arlington Towers, W-226 — Arlington, Va.

**FERGUSON-GATES ENGINEERING CO.**
Registered Professional Civil and Mining Engineers
Coal Property Reports — Valuation — Development — Plant Design — Ventilation
Allen Building, Clifford 2-5338 — P. O. Box 672, Beckley, W. Va.

**FRANK D. McENTEER**
Consulting Engineer
BRIDGES, HIGHWAYS, AIRPORTS, INDUSTRIAL PLANTS
Design, Surveys, Investigations
504 Baltimore Ave., Clarksburg, W. Va.

**PROFESSIONAL DIRECTORY RATES**

| | |
|---|---|
| 12 mos., *paid in advance* | $ 96.00 |
| 12 mos., *billed monthly* @ $9.00 ea. | 108.00 |
| 6 mos., *paid in advance* | 54.00 |
| 6 mos., *billed monthly* @ $10.00 ea. | 60.00 |

**PRESSURE CONCRETE COMPANY**
Engineers & Gunite Contractors
Design & Construction of Prestressed Tanks & Swimming Pools
Gunite Restoration and Repairs to Concrete Structures.
315 South Court St., Florence, Alabama

**ELLMANN ENGINEERING CO., INC.**
Electrical Engineers
Designers and Manufacturers of Automatic Control, Alarm and Supervisory Systems for Industrial, Commercial and Institutional Applications.
P. O. Box 3627 — Washington 7, D. C.

**BUILDERS ESTIMATING SERVICE, INC.**
Specialists in preparation of Budget, Control, preliminary & final estimates
Army, Navy & Air Force installations
120 Greenwich Street, New York 6, N. Y. — Telephone Number Rector 2-4187

**GILES DRILLING CORPORATION**
Subsurface Explorations
Large Calyx Holes in Rock
Engineering Geology Reports
2 Park Avenue — New York 17, N. Y.

**PHILIP J. HEALEY, INC.**
Engineers and Contractors
TEST BORINGS
CORE DRILLING for FOUNDATIONS
207 Baldwin Ave., Jersey City 6
Jo.Sq. 2-3313
11 Park Place, New York 7
Ba. 7-2728

**KENNEDY-RIEGGER DRILLING COMPANY, INC.**
Fred W. Riegger, P.E., President, Assoc. Mem. A.S.C.E.
Licensed Professional Engineers
Core Drilling Contractors
Diamond Drill and Test Borings
Kingsbridge 9-8458
5418 Post Road, New York 71, N. Y.

**PRECISION WEIGHING**
Travelling Balance Repair Service
Purchase and installation of Precision weighing equipment. Cleaning, Repairing of equipment in your own laboratory if required; making shipment unnecessary. Special weighing assignments undertaken. Preliminary Consultation Suggested.
**TURNER BALANCES AND WEIGHTS**
Edward H. Turner, P. E.
79 Kenneth Place, New Hyde Park, N. Y.

**PHOTRONIX, INC.**
Aerial Photogrammetry
and
Electronic Computation
*For Engineers, By Engineers*
760 King Avenue, Columbus 12, Ohio — Everett S. Preston, Chief Engineer

**SPRAGUE & HENWOOD, INC.**
*Drilling Services*
Foundation Investigations — Test Borings
Grout Hole Drilling and Pressure Grouting
Diamond Core Drilling
221 W. Olive St., Scranton, Pa.
New York, Phila., Pittsburgh, Atlanta
Grand Junction, Colorado
Buchans, Newfoundland

## Symposium

(*Continued from page 30*)

lum leading to the bachelor's degree in one of the options of engineering.

In addition to temporary summer employment, a Career-Conditional, rather than temporary appointments, may be authorized. Persons appointed to these positions will participate in special training programs consisting of on-the-job training, and regular scholastic training at an accredited college or university. The two phases of training may be carried on concurrently as a result of the trainee being employed part-time while in school attendance, or they may be alternated through employment of the trainee during summer vacation periods and holiday leave periods or during the practical work-experience periods provided in a cooperative program. Promotion to the GS-3, $3,175 per annum level, may be consummated after he has completed one full college or university academic year of study and to the GS-4, $3,415 per annum level, when he has completed two and one-half full college or university academic years of study.

IN universities utilizing the cooperative education method which is almost 100 per cent at Southern Methodist University, the opportunities to apply university training and gain practical experience is available in most Federal agencies. Cooperative training in the broad field of activities available in Federal agencies is a valuable adjunct to the theoretical training in the classroom. Some of the work performed during the period may be of a sufficiently routine nature as to permit accomplishment by technicians. Nevertheless, a limited amount of experience in this activity is deemed advisable during a training period to qualify the young engineer for later supervision of the work of technicians. For students attending universities which do not employ the cooperative system there is no dearth of opportunity for employment during summer vacations particularly during the last two years of university training. The co-op or summer school training, in addition to providing practical application for academic training, provides basic practical experience that will enhance rapidity of advancement after graduation.

*Engineer-in-Training Period.*

The initial employment period with the Federal Government will, except in the case of the more highly publicized rocket, electronics and missile programs, be largely dependent on contacts made during the phase previously discussed. Certainly if the student has had little contact with the potential advantages of Federal employment there is little competitive attraction in the beginning Federal salary as compared with that in private industry. Perhaps the starting salary is not directly connected to professional development but data compiled by the Civil Service Commission and the very competent placement officers of our engineering schools indicate that there will continue to be few engineers to develop in some of the agencies of the Federal service unless the starting salaries are improved. A recent survey by the U. S. Civil Service Commission showed entrance salaries for graduates in private industry varying from a median of $5,290, with twenty-five per cent higher than $4,544 and a maximum of $8,750. These salaries compare with a standard Government starting salary of $4,480, a discrepancy of $810 or about $65 per month. Information furnished by Dean Fred Ajax, placement director for Georgia Tech, indicates the same discrepancy of about $65 per month in starting salaries.

Ostensibly the Federal agency must have something to offer in other attractions in order to compensate for the deficiency in the pay scale. Dean Ajax mentions six items in addition to initial salary that in his opinion students consider before accepting a job.

1. Challenging opportunities which will require the man to extend himself.
2. A promotion system in which merit is the determining factor.
3. A stable agency or company where the organization will be doing engineering work for 10, 15, or 20 years so that efforts and experience count.
4. Graduate training programs where opportunities are available for further graduate study leading to a Master of Science or Ph.D.
5. Geography and job location. The job should not be at a great distance from familiar territory or in an isolated community.
6. Housing and living accommodations. Family accommodations should be available for those with families or those who are contemplating marriage.

Mr. Eugene W. Lovelace, a representative of the U. S. Army Ordnance Corps, Army Ballistic Missile Agency, who does recruitment over a large number of universities in the south and southwest, considers the graduate study program and the challenging opportunity for research in guided missiles the two most attractive features of his agency, other than the initial salary.

I believe that all of the Federal agencies are making a sincere effort to provide the attractions and opportunities that will compensate for lack of starting income. There are of course possibilities that this discrepancy can be removed and Federal salaries adjusted to the pay scale of private industry. Some of us who received our degrees twenty-five to thirty years ago may question the wisdom of the present starting salaries and other advantages. However, if we were to assume that the intense application and effort required to obtain a degree and progress in the profession justified a total income within a ten year period following high school equal to that of the individuals not seeking higher education, then initial salaries and normal progression in college trained men can still stand some upward adjustment.

THE training during the initial employment period will vary between wide limits in the various Federal

---

### *About the Author . . .*

Mr. McCoskey

Donald H. McCoskey, recently retired as chief of the Engineering Division, Southwestern Division, Corps of Engineers, Dallas, Texas, was born in Tekamah, Nebraska, January 10, 1902. He has accepted a position with the engineering firm of Tippetts-Abbett-McCarthy-Stratton, and will be stationed in Baghdad, Iraq, as their chief engineer in that country. He had served as chief of the Southwestern Division since 1950. Mr. McCoskey received his Bachelor of Science degree from the University of Nebraska in 1925.

A registered professional engineer in the states of Missouri and Texas, he is a member of NSPE, ASCE, and has also served on the United States Committee on Large Dams, and the Executive Committee of the United States Committee of the International Congress on Irrigation, Flood Control and Drainage.

agencies and the extent of pregraduation experience of the individual. Those who have participated in a regular cooperative program during undergraduate days will have had an opportunity to familiarize themselves with the work done in various departments of the agency and be better prepared to embark on a production phase of engineering. Whether the planned orientation and conference training and on-the-job experience and rotation is conducted during the cooperative or possibly summer work periods or after graduation it will usually be planned to give the newcomer to the organization a working concept of its integral parts. This training in the old established construction agencies such as the Corps of Engineers and the Bureau of Reclamation may be expected to emphasize the design and heavy construction phases of water use and control multiple purpose projects. The Corps projects will also include the military construction involved in the Army and Air Force projects, including such special projects as the Arnold Engineering Development Center of the Air Force and the Army Ballistic Missile Agency of the Ordnance Department of the Army.

The training programs of the construction agencies just mentioned emphasize the rotational program which covers a period of one to two years immediately subsequent to full-time employment. Although exceptions are made where appropriate to fit individual cases and to some extent emergency requirements that may develop within the agency, most training programs are about one year duration with two years as a top limit. The longer period permits more or longer sub-assignments but these can be unsettling to both the man and the organization. Employees look for regular continuing jobs and supervisors desire stability in their groups.

As an example of the general patterns of the rotational programs, the program of the Bureau of Reclamation is set out below:

1. Most rotational assignments are planned for three to four months. Most new engineers in that time will learn and produce a good amount, and this will give them four assignments in twelve to fifteen months.

2. Limited extensions are made when: (a) time is needed to complete a job; (b) the work is particularly valuable to the man; and (c) no other appropriate assignment is available.

3. Shorter assignments of a few weeks or even days are made: (a) when work is highly routine; or (b) of a type the man should know about, preferably first-hand, but may never have to do. (The latter applies to assignments, for example, of an electrical engineer to civil work, and vice versa.) Also a man is moved on when: (c) he completes a job ahead of schedule and it is convenient for him to move; (d) a particularly suitable assignment becomes available; and (e) a man is urgently needed elsewhere.

The personal schedule prepared to fit this rotational program is tailored to the individual in accordance with several considerations such as these:

*Career advisers* advise on individual schedules. An experienced engineer of higher grade is named as a career adviser for each engineer on rotation. He counsels with the one or more men assigned to him for advice. He gets to know the man and helps him see the alternative roads ahead and where they lead. Each man is encouraged to express his interests and desires to his adviser. The adviser then recommends to the schedule maker a tentative individual schedule for the man. He recommends what experience is needed, for how long, at what alternative spots, and in what desirable sequence.

*Flexible length of assignments.* No standard assignment length is needed. Each assignment can be allowed a range. For example, one may be scheduled for three months plus or minus two weeks. Another may be set up for four months plus or minus three weeks.

*Flexible sequence.* Some one sequence of rotation may be better than others. In operation it would be a rare coincidence if rotational assignments could be made in the most desirable sequence for every participant.

*Refine, revise, and operate.* Schedules are open to change at any time. As a man approaches the end of rotation, he may be aiming toward a position being held for him, or a new and desirable opening may turn up unexpectedly. Any number of organization and work load changes can upset plans. The man's abilities and interests may prove different, after some experience, than he and others expected, and daily developments may force assignments out of schedule.

THESE rotational programs are being re-evaluated continuously both by opinions of senior supervising engineers and by information obtained from the engineer trainees. The length of the Bureau of Reclamation program has been generally standardized at about one year while that of the Corps of Engineers is about one and one-half years. Subsequent to the rotational program it appears that the young engineer begins to shape his own destiny. Professional development by no means ceases, but the young engineer begins to decide for himself the field of emphasis on his further training. From experience with both organizations, I know that the senior supervisors are constantly thinking in terms of the technical improvement of the engineers in their organizations which include encouragement to participate in the activities of professional societies.

The research and development agencies of the Defense Department and other independent Federal agencies are probably the principal users of engineer talent in recent years. These agencies utilize few civil engineers but draw heavily on the available mechanical, electrical and aeronautical engineering graduates. Training programs in these agencies tend toward specialization and emphasis toward pioneering development. For example, the Army Ballistics Missile Agency has a three-phase program starting with the first year in college and extending through a five year cooperative program and three years of advanced study culminating in a degree of Master of Science. The cooperative program for this agency is identified with eight universities. The graduate study program is under the general supervision of the University of Alabama although there is a joint steering comittee and faculty composed of senior engineers from the Army Ballistics Missile Agency and Redstone Arsenal.

An almost identical three-phase cooperative program is offered by the U. S. Naval Air Missile Test Center at Point Mugu, California. The cooperative program during Phase I embraces a three-year cooperative work-study program with the Ventura College. The student is initially employed as an Engineering Aide, GS-2. He is employed on a full-time basis at full pay during the first summer and is given an opportunity to participate in military reserve training during the second and third summers. During the first three academic years, the

student attends school one-half day and works at the Center one-half day for which he is paid in his grade for the actual hours worked. The academic portion of this phase covers the first two years of an engineering curriculum leading to an Associate in Arts degree. The work portion consists of rotational work assignments of increasing technical difficulty and responsibility under the instructive guidance of competent engineers. Phase II provides for a full-time scholarship with full-time pay at either Berkeley or Los Angeles Campus of the University of California. The student who demonstrates his proficiency both on the job and in the classroom during the first phase of the SED program and who is able to gain admission to the University by the satisfactory completion of the Upper Division Engineering Examination is given the opportunity to pursue the upper division portion (junior and senior years) of the engineering curriculum under a full scholarship. Upon acceptance of the scholarship, the student is required to sign a training agreement which provides for an obligated work period. Under this phase of the program, the student works full-time at the installation during the summers and attends the University on a full-time basis during the academic years receiving a full-time salary at a grade level of GS-4 and GS-5, respectively, during these two years. Upon graduation and the receipt of a Bachelor of Science degree in engineering, the student is assigned professional engineering duties at the Center as a regular member of the technical staff.

Phase III is a three-year obligated work period. The student is obligated to work one year of Federal service for the first year of scholarship, and two years for the second, making a total of three years of obligated service to the Government for the training during the second phase of the SED program. During the period of service under Phase 3, the student is given an opportunity to take advance work at the Center leading to a Master of Science degree.

A very complete graduate training program is carried out under the supervision of the University of Maryland with the U. S. Naval Ordnance Laboratory at White Oak, Maryland. These courses lead to Master of Arts and Master of Science degrees. Perusal of the courses offered here as well as in the other two agencies just previously mentioned place heavy emphasis on advanced mathematics, physics and nuclear elements in the aeronautical, electrical, mechanical and chemical engineer fields.

Another training program somewhat similar to those mentioned is a part of the educational and promotional policy of the National Advisory Committee for Aeronautics. Young engineers enter the program with a Bachelor of Science degree in the grade of GS-5, but are permitted opportunity of advancement quite rapidly within a 6-months period through completion of a special course offered for aeronautical research interns and junior engineers.

THE courses of study mentioned in connection with the research agencies are of course those having primarily application to the research and development phases principally in the mechanical, electrical, aeronautical and chemical engineering fields. The completion of these courses would have generally only cursory value in the construction agencies except for that phase of those agencies involved in work of a research nature, such as the Engineering Research and Development Laboratories, and the Waterways Experiment Laboratory of the Corps of Engineers, and the Denver laboratories of the Bureau of Reclamation.

*Achievement Period.*

The development of engineers subsequent to the initial two to five year period in the Federal service does not appear to follow any prescribed pattern in any of the Federal agencies. Opportunities exist however for pursuing technical development here on perhaps a much broader scale than in business or industry. There seems to be an indication that at about this point the engineer begins to channelize his activities into the field that gives promise of the greatest economic return rather than pure technical achievement. A survey made by the Civil Service Commission of terminated scientists and engineers, GS-12 and above, covering about 200 case histories, showed seventy per cent of these men, received higher salaries in private industry. Of the twelve factors evaluated in the questionnaire, low salary and lack of advancement opportunity accounted for seventy-six percent of the decisions to leave the Government service according to frequency of mention. There is little that can be offered at this point by the Federal agency in the field of professional development that will be more attractive to the young engineer than the higher salary. The various fringe benefits and retirement policies of the Federal Government are probably at least as atttractive as those of private industry and the permanency of employment is probably as good or better. Probably the principal attraction of the Federal service will be in the multiplicity of jobs and assignments which it is possible to obtain together with opportunities for overseas service and travel if the young engineer would be so inclined. Beyond the initial five years of the engineer's career there may be some question as to whether or not professional development along solely technical lines is advisable. At the risk of being out of character with my subject, it may be proper to suggest that there are a great number of other things that an engineer needs to know which are not directly related to engineering technical achievement. Many of us in Federal service find that in the supervisory level that a working knowledge of practically every type of engineering and including some architecture is essential in our day to day activities. From time to time a mechanical engineering, electrical engineering, air-conditioning or problem of appearance may occur in addition to innumerable other items pertaining to airfield pavement design and water use and control projects. Cooperation and coordination with other Federal agencies and corollary state agencies and a knowledge of their activities is also required. Add to this a requirement for some contract and water law, management and applied psychology and the military and functional needs of the various arms and services and you begin to drift from detailed engineering technology. An engineer must also acquire some knowledge of administration and management tasks and be able to give sound advice and counsel in conferences concerning the affairs of the agency for which he works. Although it may be argued that these are not engineering tasks and should be performed by others, a working knowledge is essential, otherwise ultimately decisions will be made by an administrator on other than engineering considerations. ***End.***

## *Mr. Schmidt's Remarks . . .*

A SIMPLE reading of the title would lead me to believe that in accepting this responsibility I should delve into and report upon the assignments with which young engineers in state government are per-

*(Continued on page 45)*

# STRICTLY BUSINESS

***Personalities . . .*** **Stone & Webster Engineering Corporation,** Boston, Mass., and New York, N. Y., has announced the appointment of **Theodore E. Casselman** as chief chemical engineer. Also, **Robert J. Carter,** district manager for the Corporation in Houston, Tex., has been named a special assistant to the managing director of **E. B. Badger & Sons Limited of London,** a subsidiary of **Stone & Webster** in Great Britain . . . **Phillips L. St. John** has been named project manager in plant engineering at the Oswego, N. Y., plant of the **International Business Machines Corporation** . . . Two new **Trane Company** branch office managerial promotions have been announced by Vice President **A. C. Menke. Joseph Rohats** now heads the Phoenix, Ariz., office, while **Robert Knowles** directs the Greenville, S. C., office . . . **H. L. Buffington,** president of the **Punxsutawney Company,** Punxsutawney, Pa., announces the appointment of **Robert Miller** as chief engineer of the Company . . . **Stephen Johnson, Jr.,** has been appointed general manager of the air brake division of **Bendix-Westinghouse Automotive Air Brake Co.,** Elyria, Ohio . . . **Reginald G. Schuler** has been named general engineering manager of **Brush Electronics Company,** Cleveland, Ohio, according to an announcement by **Dr. D. B. Parkinson,** vice president of engineering.

**Mr. Casselman**

**Robert W. Frank** has been elected vice president of **Birdsboro Steel Foundry & Machine Co.,** Birdsboro, Pa. . . . **Charles W. Hanson** has been appointed a refrigeration and air conditioning representative for the **Recold Corporation,** of Los Angeles, Calif. . . . A new staff engineer, **John J. Parks,** has joined **Seiberling Rubber Company,** Akron, Ohio . . . **Paul Jordan,** plant engineer at the **Dodge Manufacturing Corporation,** Mishawaka, Ind., has been appointed director of engineering, according to an announcement by **David Firth,** vice president in charge of engineering . . . **Brigadier General Robert G. Lovett** (U. S. Army, ret.) has been named manager of the new Kingston, Jamaica, office of **Rader and Associates . . . Brooks Rotameter Company,** Lansdale, Pa., announces the appointment of **George D. Keller** as its chief engineer . . . **Benjamin Fridge has joined the Menlo Research Laboratory,** San Jose, Calif., as director of engineering . . . **Dr. W. A. Raimond** has been named technical director of the Engineering and Construction Division of **American Cyanamid Company** with headquarters in Bound Brook, N. J. . . . The appointment of **Archie F. Boscia** as chief product engineer for **Kin Tel Division** of **Cohu Electronics, Inc.,** San Diego, Calif., has been announced by **William S. Ivans, Jr.,** vice president for engineering.

**Mr. Jordan**

**Elwin A. Spencer** has been named chief engineer of the **International Latex Corporation,** New York, N. Y. . . . The board of directors of **The Mount Vernon Company,** Mount Vernon, Ohio, has elected **Ivan A. Bickelhaupt** to the presidency of the Company . . . **Lowell B. Moon** has been appointed development manager of the **Kennecott Copper Corporation,** and will direct the engineering phases of the Company's exploration activities from his New York City office . . . **Lyle Carnick,** president of the **Copco Steel & Engineering Co.,** Detroit, Mich., has announced the appointment of **Clarence C. Griffith, Jr.,** as director of manufacturing . . . **Auburn & Associates, Inc., Engineers,** Pittsburgh, Pa., have announced several personnel appointments—**William B. Kennedy** is assistant vice president in charge of Civil Engineering Department; **Carl W. Oettinger** is chief electrical engineer, and **Robert W. Leech** is vice president in charge of heavy steel mill engineering sales . . . **Manny Lenkowsky** has been named chief engineer of **Consolidated Diesel Electric Corporation of Canada, Ltd. . . . Brigadier General Robert E. Galer** (U. S. Marine Corp, ret.) has joined **Tempco Aircraft Corporation,** Dallas, Tex., as manager of engineering programs . . . **Jack Hatcher** and **Richard Ward** have assumed engineering duties at **The Maytag Company,** Newton, Iowa . . . The appointment of **Frank A. Morris** as director of the newly-established **Stromberg-Carlson** Telecommunication Research Department has been announced.

**Mr. Griffith**

***Expansion . . .*** A $50-million, 7-year industrial expansion program adding nearly 100,000 tons of annual productive capacity at plants throughout the country has been completed by **National Carbon Company,** Division of **Union Carbide Corporation** . . . To increase productive capacity, the **S. Morgan Smith Company** has moved all valve operations from their R.S. plant in Philadelphia, Pa., to the main plant in York, Pa. . . . The **American Photocopy Equipment Company,** Chicago, Ill., announces the opening of a sales office in the Pittsburgh, Pa., area—at Steubenville Pike in Robinson Township.

***New Offices . . .*** **Simmerson and Bell, Engineers,** and **K. C. Mack and Associates, Engineers and Associates,** announce the opening of their offices at 205 Worth Avenue, Palm Beach, Calif. . . . **Ketchum & Konkel, Consulting Engineers,** recently opened a new $85,000 office building at 730 Kalamath Street, Denver, Colo.

***Merger . . .*** **Hunt Engineering Company, Lorell & Sicular, Consulting Engineers, G. C. McKinney, Civil Engineer,** and **Paul L. Verner, Land Surveyor,** announce the merger of their offices under the firm name of **McKinney Associates** with offices at 2150 The Alameda, San Jose, Calif.

## Symposium

(*Continued from page 43*)

mitted to cope and the effectiveness of their efforts. However, from the correspondence preceding the printed program I find "The young engineer is not being attracted to government service. Why is this true and what may be suggested to remedy the situation?" A sentence or two later in this same correspondence will be found "How can the young engineer be impressed with the ideal of professionalism?" Reference is also made to the problem of unionism in the profession and questions what should be done about it.

At the outset let me say that I have found many of the facets of the young and the mature engineer in state government service to be inseparably integrated. As a result the remarks to follow at times will unavoidably blend their respective roles into one package.

I am firmly convinced that all of these matters or problems as the case may be lie within the hands of we the people of the engineering profession for appropriate attention though there is a division separating some of the phases which this Society should assume and those which belong to the state employed engineers for both individual and collective action. The diligence and intelligence with which we pursue these responsibilities will measure the timing and effectiveness of our solutions as well as to curtail if not to completely annihilate unwanted union meddling in our affairs. From data at hand, the 1955-56 graduate engineers entering state government service in Texas received ten per cent less starting salary than the across the board average and fifteen per cent less than the average of the highest paid by a single industry. I do not have statistics on intermediate and mature engineering salaries. I do know that losses of engineers from within our department to other employment were spread through all three groups with the greatest number falling in the intermediate area some seven years after graduation. Roughly classified these are engineers who have gained their professional license (in Texas a minimum of four year's experience plus an engineering degree) and have had time to rotate through basic essentials of the broad phases of highway engineering. They have become qualified in their field through the auspices of state government service. They are much too young to feel indivisible affection for their job in the face of challenging opportunities and greater salaries outside. Also they have not settled into highly specialized departmental slots, they are not wedded to the community for friends and they have not penetrated retirement plans sufficiently to think twice before separation.

Strangely, these same statistics show appointments and reappointments to lag only slightly behind losses in this same intermediate area. Some of this may be attributed to a return from military service though most of such returns should fall at an earlier date. In any event some phases or attributes within state service have a Pied Piper tune calling them back. It should reach more ears. When we can identify these items and if need be build a prototype for display and education we should then obtain a just proportion of the annual engineering graduates in state posts with gumed backs to hold them in place beyond the license and basic experience years. By then community life, local investments, retirement plan, etc. should hold them, assuming good relations and working conditions continue. All in all, if we are to obtain young engineers we must first and foremost provide salaries that will support an average professional man and family in the station of the community he should be expected to attain all without undue financial worries. If this is not done some may stay but heaven help their superiors.

While starting engineering salaries are restricted in size, appropriations for most departments provide for advancements in both responsibility and salary as the registered professional engineers license mile post is reached and passed and as higher levels of achievement receive like treatment. This places a responsibility on the supervisor to function at regular intervals in behalf of his employees.

LATER I had the privilege of observing the substitution of seniority for merit in determining salary increases of this kind. While this system did point out and rectify some irregularities, the redefining of the professional intellectual aspects of engineering into terms of physical accounting proved its undoing. The supervisor now reviews the progress of the engineers in his employ and based upon merit recommends appropriate increases within the ceilings provided by law. This is something all engineers understand for most of their decisions in final analysis, are based upon merit. Under this system the supervisor who fails to assign opportunity so that merit increases can be earned exposes himself and his agency to the inroads of unionism. Under such administration the employees themselves will find ways and means of discrediting the supervisor.

A second means of legislative increase has been granted from time to time in the past as a blanket per cent of some figure such as the first $2,500 per annum earned. This type affects all employees, professional and otherwise and has for its justification higher cost of living indices. We can and should look to the Texas State Employees Association to plug for increases of this type, lending any assistance they seek for realistic results.

In the appropriation bill just passed we witnessed increases for professional engineers as such, to assist in retaining manpower where critical shortages exist. Though upward position adjustments have occurred in earlier actions, this was the first professional engineer increase given in substance state-wide application. It poses a third basis for salary adjustments as well as to add to the prestige of the state employed engineer. It is in this area that the Society gave its most effective help last year.

(*Continued on page 48*)

## *About the Author . . .*

**Mr. Schmidt**

R. L. Schmidt was born in Tarrant County, Texas, in 1906 and attended public schools in Fort Worth. He entered the University of Texas in 1925 for four years of engineering study. He joined the Texas Highway Department immediately thereafter for service unbroken to date, including engineering employment in the Construction Division, the Bridge Division and the Road Design Division in the order named. He became assistant to the chief engineer, Construction and Design, in 1939 and assistant to the state highway engineer in 1941. Mr. Schmidt became the assistant engineer, Land Service Roads in 1945 when that Division was created and has served in that capacity to date.

He is currently serving as state director of the Texas SPE from the Travis Chapter and has only recently been re-elected as an Employee Member, Board of Trustees, Texas Employees Retirement System.

# ...NEW LITERATURE...

***To help the offering firms determine which literature you require, when requesting an item, be sure to list all specifications shown . . . and say you saw it in the AMERICAN ENGINEER.***

**TECH BOOKLET**—The first of a series of ten contemplated educational booklets on "Systems Engineering Applied To Combustion Control" is now ready for distribution according to word received from the publisher, Cleveland Fuel Equipment Co., producers of "Cleveland Controls." The systems concept which produces automation-in-combustion is introduced in both theory and application. The need for specific instruments for efficiency and safety, and their correct integration into the system is discussed in the introductory 16-page booklet. Thoroughly developed in this first booklet are the reasons for, and the fundamentals of draft control. The requirements and mechanics of draft control are treated in an easy-to-read, step-by-step exposition. Interlocked controls and safety devices are explained. Illustrated with diagrams and pictures, Booklet No. 1 is a complete, ready reference for engineers, designers and operating personnel in the combustion field. By registering now for your copy of Booklet No. 1, your name will be automatically placed in the mailing list to receive all successive booklets according to O. A. Reiter, sales promotion and advertising mgr. Write him for your copy at Cleveland Fuel Equipment Co., 141 Brookpark Road, Cleveland 9, Ohio.

—AE—

**MANUFACTURING SERVICES**—Manufacturers with engineering problems or in need of supplementary engineering or drafting talent during peak periods may find a solution in the new, descriptive brochure available from Associated Engineers, Inc., Agawam, Mass. The brochure explains and illustrates the firm's six basic divisions of Mechanical Engineering, Tool Engineering, the Industrial Laboratory, the Special Services Division (technical writing), the Special Products Division and the large manufacturing plant. "Meet Associated Engineers, Inc." is the title of the brochure which can be obtained without obligation by writing for it on your firm's letterhead to Associated Engineers, Inc., 127 Silver St., Agawam, Mass.

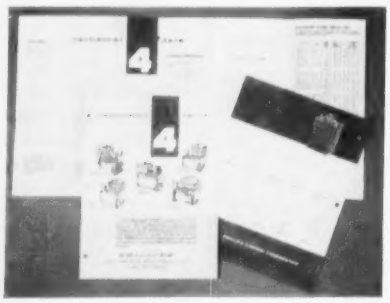
—AE—

**INTERMEDIATES**—A bulletin describing the advantages of using sensitized intermediate whiteprint materials is now available from the Ozalid Division of General Aniline & Film Corporation, Johnson City, N. Y. The bulletin suggests how intermediate materials will enable design engineers, draftsmen, and technicians to cut drafting time, speed design changes, safeguard valuable originals, and make complete prints. The bulletin gives complete catalog listings and descriptions of all Ozalid intermediate materials. For a copy and further information, write without obligation to Ozalid Division, General Aniline and Film Corporation, 5 Corliss Lane, Johnson City, N. Y. In Canada to Hughes-Owens Co., Ltd., 1440 McGill College Ave., Montreal 2, Quebec, Canada.

**PRESSURE GAGES**—The complete line of Helicoid Gages, pressure instruments of utmost precision and enduring accuracy and suitable for industrial, processing and chemical applications, are graphically described and illustrated in a 32-page booklet, Catalog G-52, issued by the Helicoid Gage Division, American Chain & Cable Company, Inc., Bridgeport 2, Conn. According to the manufacturer, these instruments can be used on such services as engines, turbines, blowers, locomotives, hydraulic presses, tractors, pumps, compressors, or wherever a gage is subjected to violent pressure pulsations or severe mechanical vibrations. Valuable engineering information describing how the gages work, types of systems, adjustments, applications, dimensional drawings, specifications, accessories, etc., are given in addition to a listing of recommended uses.

—AE—

**RELAYS**—The latest in a series of engineering bulletins from Phillips Control Corporation, Joliet, Ill., provides a comprehensive report on the Type 4 relay. It is available along with other relay studies in an



attractive, three-ring, loose-leaf binder. The new bulletin deals with specific applications involving coils and contact arrangement of the Type 4, showing four basic groups in actual size drawings. Photographs, features and other technical data on coil characteristics, contact forms are included for both enclosed and hermetically-sealed relays. A standard stock relay listing shows the operating specifications of Type 4 relays readily available. Requests may be directed to Phillips Control Corporation, 59 W. Washington St., Joliet, Ill.

—AE—

**PIPE & TUBING**—Engineers, designers and others involved in the fabrication of pipe and tubing will be interested in Bulletin TDC-187, recently released by the Tubular Products Division of The Babcock & Wilcox Company. This six-page folder describes the various methods of bending pipe and tubing and supplies helpful hints which will overcome many of the fabricators' bending problems. Copies may be obtained without charge at the sales office of the company, Beaver Falls, Pa.

**SEWERS**—The values and benefits of properly installed and adequate sanitary sewer systems are clearly described in a new, illustrated booklet, produced by the Clay Products Association, Chicago, Ill. The 12-page brochure, entitled "Planning For New Sewers" has been hailed as a practical working handbook which outlines all the basic steps necessary in the planning and development of domestic and industrial waste facilities. Applicable to communities of all sizes, the points outlined in the booklet cover the initial steps in planning adequate sewerage systems, through methods of financing to engineering the project. Getting public approval through the techniques of public relations, choosing the right bid, and the importance of proper construction supervision are other considerations given detailed attention. The booklet concludes with a listing and explanation of field-engineer services available to community officials through various sewer industry service organizations. The brochure is designed to aid engineers, contractors and others involved in sanitation. Copies may be obtained by writing to the Clay Products Assn., 100 N. LaSalle St., Chicago 2, Ill.

—AE—

**HEATING ESTIMATE GUIDE**—A design data booklet to assist in layout of efficient heating systems for factories, auditoriums, gymnasiums and other large area buildings is being made available by Carrier Corporation. Entitled "Design Data Heating" the 71-page manual has been issued by Carrier's Unit Heater Department. It contains engineering information for determining proper application and capacity requirements of unitary or central plant systems. Subjects covered in the guide include survey, design conditions, transmission coefficients, heat loss calculations and piping sizes. Published for the convenience of engineers and architects, the booklet uses diagrams to illustrate each section. Several tables and charts are included for ready reference in estimating heat loss and sizing of equipment. The booklet can be obtained by writing the Unit Heater Department, Carrier Corporation, Syracuse 1, N. Y.

—AE—

**INDUSTRIAL TIRES**—A 36-page illustrated guide book that explains all phases of industrial tire use has been published by B. F. Goodrich Tire Company, Akron, Ohio. It is written for maintenance superintendents, industrial engineers and purchasing agents. In addition to specifications for all types of industrial tires, the book describes 1) the complete B. F. Goodrich line in detail, 2) the use of each type of industrial tire, 3) the variations in pneumatic tire capacities at various speeds, 4) the wheel and caster combinations available, 5) the latest available truck manufacturers' tire specifications, and 6) how to change steel wheels to rubbertired wheels in three easy steps.

***These listing are informational only and are not an endorsement of the products, nor of the manufacturer's claims.***

## Kurtz

(*Continued from page 39*)

opposing people are portrayed as being "aggressive," "immoral," and "evil" . . . while identical behavior on one's own side must always be explained as being "defensive," "moral," and "good."

THE national military power of each side provides the essential environment of potential danger to the people of the opposing side. If national military power did not exist, it would be impossible to create this environment of potential danger on a reciprocal basis which is a prerequisite for war between nations.

But as long as individual nations are allowed to control individual national military forces, wars will continue to generate endlessly in roughly predictable patterns. National military power is the strategic factor. It can be controlled.

The above reciprocating environments of anxiety can be observed in relation to wars throughout modern history, at least.

Only one basic change now is noticeable . . . the new dimension of Air Power has increased the range of fear and anxiety from foreign military power to its near-global limits.

The area of the world involved in a single war used to be limited by the basic range of military power.

Other nations become involved in a war only when they come within range of potential disaster, to arouse their national fears and anxieties.

Air Power, today, has brought the U. S. and the U.S.S.R. into a new "closeness" which never has existed before in history. Today each of these two dominant military powers remaining after the last war is within immediate range of the other's capacities to drop crippling atomic and hydrogen and more terrible bombs. Intense American public apprehension is pegged to the potential threat of Soviet military power, and intense Soviet public apprehension is pegged to the potential threat of American military power.

If each nation simultaneously could be deprived of the control of national military power this whole phenomenon of war would disappear like the disappearance of an electric field when the electricity is turned off.

But as long as each nation is allowed to continue to control national military force, the back-and-forth, back-and-forth increasing regeneration of anxiety will continue to build up explosive human motivations . . . until war comes as a release from tension-and-frustration.

Beliefs in materialism or particular religions are not critical, or even important factors in the generation of war. Beliefs in peculiar national political systems are not strategic or even important factors in this build-up for the most awful war civilization will ever have seen. These are merely the themes of the speechwriters, exhorters, manipulators, politicians, circulation-builders, editorial writers and historians who try to explain their predicaments in terms of superstitions and fantasies of imagination.

The critical factor in the phenomenon of war is tangible, real, concrete and observable.

It is *national military power*. It has been conceived by scientists, designed by engineers and mobilized by people on both sides who are afraid. Once the deadly dynamics of war have built up between two nations, it then would be suicidal if one nation suddenly disarmed or decreased its military power. It would be overrun by force of the pent up fears and anxieties of the opposing people.

Today's critical situation might be visualized by watching two armed men on the opposite sides of any war. Each has raised his loaded gun to firing position, cocked it, aimed it at the other's heart and placed his finger on the trigger. Each man is of a different faith . . . each has a different patriotic loyalty . . . each is deeply convinced that the other is about to kill him and is now willing to die in self-defense. Although starting from different conscious loyalties and ideals and identifications the universal controls of anxiety have taken command of the behavior of both men to the point where they are doing exactly the same things, in exactly the same way, with exactly the same motivations. Fear and anxiety are common ground which tend to make people of all races, colors, creeds and nationalities react with identical actions regarding the thing which has aroused the anxiety.

THE crucial question of this age is whether it is possible to enter this tense picture and take away the guns from these two men.

If this is possible, we will have taken action in the physical world, by removing the guns.

We will have changed the psychological atmosphere by removing the explosive charge of anxiety which had been built up between the two men.

We will not have intruded into the realm of spiritual or philosophic contentions, nor into the realm of national loyalty and patriotism.

Each man can continue to be unequivocally patriotic and loyal to his country. It is not necessary to kill foreigners to be patriotic, if one's own nation is not threatened.

Each man can continue to worship as he choses. It is not necessary to kill in order to believe.

By removing the guns, we will not have trespassed into the realm of each person's patriotisms and beliefs.

When national military power is recognized as the strategic factor in the phenomenon of war, it becomes possible to evaluate actions and policies aimed at averting war.

The League of Nations failed to prevent the build-up for war because it failed to control the strategic factor of national military power. The United Nations has failed to prevent the build-up towards an even more dreadful war because it failed to control the strategic factor of national military power.

All efforts will fail to prevent the build-up for war until a world-wide safety organization is brought into being which has a monopoly control of military power and can prevent any nation or group of nations from waging war, or threatening to wage war, against any other people.

During the period of growth, before all nations in the world belonged to this safety organization, it will have two primary missions (1) to prevent war between any member nations or areas and (2) to defend all member areas from any threat from outside powers.

Checks and balances of multi-national political control will have to be worked out to guarantee that this world-wide safety organization will not, itself, become an instrument of tyranny or oppression.

The impact of science on society today is to raise the question whether or not it is possible to create from the U.N. such a world-wide safety organization which can prevent war. It is a practical question of large scale organization.

The question of this age is whether large scale multi-national collective strength can be created in a world-wide safety organization committed to the mission of preventing war. This will mean the elimination of individual national freedom to threaten war unilaterally.

Safety is a universal objective.—***End.***

## Symposium

(*Continued from page 45*)

Let us examine a few records to see if low salaries are closing the state government service field gradually to young engineers.

A most helpful interview with Dr. B. H. Amstead, director, Engineering-Science Placement Office, University of Texas, assured me that students were not bypassing civil engineering, percentage-wise, in any manner that could be attributed to a lessening of need or attraction to state and local governmental agencies. He called attention to the specialized branches that have broken away from civil engineering, the parent. While some of these so-called off-springs are being graduated in numbers greater than civil engineers, this is attributed to need as created by expanding industrialism and the increased national defense demands as well as salaries. It seems safe therefore to assume that the state employed engineer continues to command a most attractive place in the minds of some who seek engineering degrees.

IT has been the practice of the Texas Highway Department for many years to develop and train many of its instrument men, laboratory technicians and inspectors. Should the shortage of engineers available to our department continue and the work load increase it may be necessary for the department to school technicians in more and more phases of our engineering work. After all Electronic Computers and the streamlining of procedures have their limitations. This job dilution process may help through an emergency. On the other hand it would cut into the accepted principle of job succession, retarding the development of our engineering supervisors of tomorrow. When the need eases off and accredited engineers resume their full normal duties, should more of these crash program specialists have been developed than can be absorbed elsewhere within the organization it may be assumed that a condition has been seeded for unionism on the very borders of our profession. It follows that all professional engineers, those in industry, those in consulting practice and those in governmental service (local, state and Federal), should cooperate to avoid job pirating. Where fundamental weaknesses occur in any outlet for engineering practice whether it be low salaries or otherwise, that would point to a lessening of needed man power at that location, perhaps it would be well for the good of our profession to exert our composite influence to erase the deficiency. The young state employed engineer will graciously accept your support for adequate salaries during coming sessions of the state legislature.

The only reliable means of attracting the graduate engineer in spite of "beyond our control lower salaries" would be to lend a helping hand during undergraduate years and to follow through with considerate attention thereafter. We are proud of our universities and the training they demand of their engineering graduates today. Except for an illegible handwriting, I consider the graduate of today far superior in training to those of my time. On the other hand scholarships though more numerous lag behind the increasing costs of this education. In almost all cases the cost of one more year has added to this increase as well as the doubling of tuition and higher costs in all other phases of campus life. Many of our engineers originate in families of average means where this financial burden is not only real but serious. The helping hand of part time or summer work appears as manna from heaven.

IN my experience, office inefficiencies arising from such practices are products of the imagination or can be attributed directly to mismanagement. They do absorb a large proportion of managements time for assignments, directions and explanations. On the other hand Dr. Amstead advises that seventy-five per cent of graduates having benefited from such part time work, accept permanent employment with their benefactor. This will more than compensate for the added instruction time. The follow through with considerate attention thereafter, includes the many items of good personnel management known to us all, such as opportunity for freedom of thought and application of knowledge led not directed into creative channels and healthful working conditions supported by such fringe benefits as retirement, group insurance plans, etc. An employee so handled can and will point with pride to his work and to his associates.

The word "professionalism" is difficult to define. And yet we ask ourselves what steps can be taken to impress our young engineers with the ideal of professionalism. The dictionary I use—*Webster's New Collegiate Dictionary*—defines it as "Conduct, aims, qualities, etc., characteristic of a profession . . ." So I then turn to this same source of information for a clear definition of "profession." There I learn of "the profession of arms, of teaching; the three professions, or the learned professions, of theology, law and medicine." No mention is made of engineering. By this time I am not only confused but also chagrined. I assume by professionalism we refer in combination to the code of ethics of our professional society, to Neiman-Marcus, etc., for outward appearance, to the church of our choice for Christian living, to our wives for the touch of domestication and individualism and to civic clubs for a share in the bolstering of community welfare. In general could it be recognition, desirable in character which we are attempting to instill in the young engineers, that permeates our work and comes to rest after it has encompassed the whole of our very being and extended beyond to its most remote influence? Assuming this definition comes close to that with which we are to infuse our young engineers, I must report complete failure to find an answer suitable for an office manual or one that can be assigned to an assistant for installation and operation and from which we may turn completely and serenely at ease to other matters of business. Reluctantly, for I recognize the work involved, I must admit that it is a job which we must do for ourselves by example. How else? If you are sincere in your wish to bring professionalism to young engineers then get started. It is as simple as that. Moreover, as each daily pleasure or chore is met, the influence of this ambition must be considered with appropriate steps taken until the essential self discipline involved becomes second nature through habit, a characteristic with which we are all so richly endowed.

Perhaps the most vital step not only to the profession as such but to the individual engineers as well, would be to provide a membership within the Society near the 100 per cent saturation point. I do not have figures on engineers in training. We can count only twenty-seven per cent of the Texas licensed engineers as members today. With a united front and ready access to all engineering offices, our messages to the young engineer could and would reach them all. Then too, if this were nation-wide, at least one of us would know the right person in the G. & C. Merriam Company, of Springfield, Mass., publishers of the dictionary previously mentioned, so that the learned three might be described in the next edition as the learned five to add engineers and scientists.—***End.***

## Engineers' Week

(*Continued from page 31*)

veloping projects such as guided tours for high school seniors, setting up exhibits, displaying posters, and obtaining local publicity in newspapers and house organs.

The booklets may be ordered in quantity, at no charge, from the National Society. More than 8,000 copies of a similar booklet were distributed to industry for the 1957 Week.

A series of Action Letters for the 1958 Week will be sent to state societies and local chapters beginning in October. These bulletins will carry suggestions for Engineers' Week ideas that can be put into practice at the state and local levels. The Action Letters will also describe the aids available from the National Society.

The 1958 theme was chosen because of the example of "horizon building" that is involved in such a world-wide scientific activity as the International Geophysical Year. Engineering has given us the instruments, the rocket fuels, the electronic devices, and all the other equipment which is being used to gather information during the IGY.

A reproduction of the 1958 National Engineers' Week poster design will be printed in the October issue of the AMERICAN ENGINEER.


## CLASSIFIED ADVERTISING

**Minimum 3 lines.**
**Undisplayed: $1.80 per line.**
**Displayed: Same rate as General Advertising.**

**Positions Wanted: Undisplayed, 90c**
**Displayed: General Advertising rates, less 50%.**
**Box Number chargeable as one line.**

**Mail Box Number replies to:**
**AMERICAN ENGINEER**
**2029 K Street, N.W. Washington 6, D. C.**

**Positions Wanted**

Civil Engineer, P.E., age 36, experienced in design of highways, structures, sewage treatment plant, general town engineering, reports and office management. Desires to associate with small to medium size consulting firm leading to future partnership, to manage a branch office, to acquire an existing civil or surveying business, or town engineer position with opportunity for own practice. Present salary $9600.00 plus percentage. Box 902, AMERICAN ENGINEER.

Mining Engineer, Registered, Missouri, Colorado. Twenty years broad experience in Mining, Construction and Public Works. Desires position of responsibility. Employed, available 30 days. Box 903, AMERICAN ENGINEER.

**Positions Wanted**

Energetic man with alert mind, 5 years practical experience, seeks position for specifications and estimations of hydroelectric power-stations, structures, roads, buildings (German, English, Spanish, French) in consulting engineer office, preferably Western Coast. Write to Box 901, AMERICAN ENGINEER.

**Employment Agency**

**Wanted Engineers, Designers, Draftsmen** All lines. Chemists, teachers and industrial engineers. Recent grads. Cleveland Engineering Agency, 2132 E. 9, Cleveland 15, O.


## Utilization

(*Continued from page 27*)

engineering at the University of Houston, will preside. The symposium will cover the role of the technician in research and development, in manufacturing and production, and in sales and service.

The conference at Pennsylvania State University, scheduled for personnel at the executive level, will be sponsored by the University and the Pennsylvania Society of Professional Engineers. A second conference for supervisory personnel will be held later in the year at the University.

Principal speakers for the first day of the conference are: C. H. Linder, vice president, engineering, General Electric Company; J. W. Hinkley, president, Research Corporation of America; and H. G. Maynard, president, Methods Engineering Council.

Speakers for the second-day sessions are: W. W. Watts, executive vice president, Radio Corporation of America; and Dr. D. B. Keyes, consultant, Arthur D. Little.

## Advertisers' Index

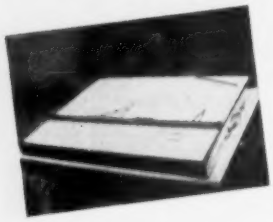

Adache Engineers ..... 38
Albright & Friel, Inc. ..... 39
Ammann & Whitney ..... 37
Andrews and Clark ..... 37
Asphalt Institute ..... 1 and 2
Michael Baker, Jr., Inc. ..... 39
Harry Balke Engineers ..... 38
Elmer S. Barrett Associates ..... 38
E. D. Barstow & Associates ..... 38
Black & Veatch ..... 36
Norman Boosey ..... 10
Borden Metal Products Co. ..... 12
George W. Brandt, Engineer ..... 38
Brockway, Weber & Brockway, Inc. ... 36
Brown & Blauvelt ..... 37
Builders Estimating Service, Inc. ..... 40
Burns & McDonnell ..... 37
Burns & Roe, Inc. ..... 37
Henry J. Campbell ..... 37
Capitol Engineering Corporation .... 39
Homer L. Chastain & Associates .... 36
Chas. W. Cole & Son ..... 36
Commonwealth Associates, Inc. ..... 36
Consoer, Townsend and Associates .. 36
Crescent Engineering Company, Inc. . 36
DeLeuw Cather & Company ..... 36
Thomas E. Duce Associates ..... 40
Ellmann Engineering Co., Inc. ..... 40
Engineers Testing Laboratory, Inc. ... 40
Eustis Engineering Company ..... 36
Eugene K. Falls ..... 36
Fay, Spofford & Thorndike ..... 36
Ferguson-Gates Engineering Company 40
Forrest and Cotton ..... 40
Foster & Cafarelli ..... 37
Frazier-Simplex, Inc. ..... 39
Freese & Nichols ..... 40
Gannett, Fleming, Corddry & Carpenter, Inc. ..... 39
Giles Drilling Corporation ..... 40
Gustave M. Goldsmith ..... 38
Green Engineering Co. ..... 39
Hall Laboratories, Inc. ..... 39
Alexander Hamilton ..... 9
Hardesty & Hanover ..... 37
Frank E. Harley & Associates ..... 37
Frederick R. Harris, Inc. ..... 38
Harris, Henry & Potter, Inc. ..... 39
Philip J. Healey, Inc. ..... 40
The Hinchman Corporation ..... 36
Howard Needles, Tammen & Bergendoff ..... 38
Industrial Ovens, Inc. ..... 38
Institute of Scientific Studies ..... 10
Jones, Henry & Williams ..... 38
Kaiser Engineers ..... 36
Kennedy-Riegger Drilling Co., Inc. .. 40
A. C. Kirkwood & Associates ..... 37
Elmer A. Kish ..... 38
Kuljian Corporation ..... 40
D. C. Latella & Associates ..... 40
Law-Barrow-Agee Laboratories, Inc. . 36
Lawrie & Green Associates ..... 40
Lockwood, Andrew & Newnam ..... 40
Louis J. Lucas ..... 40
Madigan-Hyland ..... 38
George Stanley Marshall Associates . 38
Frank D. McEnteer ..... 40
Merritt & Welker ..... 36
Metcalf & Eddy ..... 36
Modjeski and Masters ..... 40
Moran, Proctor, Mueser & Rutledge .. 38
Niagara Blower ..... 11
The C. W. Nofsinger Co. ..... 38
H. D. Nottingham & Associates ..... 40
James P. O'Donnell ..... 38
Oklahoma Testing Laboratories ..... 39
John Ostborg ..... 38
Palmer & Baker Engineers, Inc. ..... 36
Parsons, Brinckerhoff, Hall & MacDonald ..... 38
V. C. Patterson & Associates ..... 40
Photronix, Inc. ..... 40
Pittsburgh Testing Laboratory ..... 40
Plumb, Tuckett & Pikarsky ..... 36
PortaTrace ..... 6
Portland Cement Association ..Back Cover
Praeger-Kavanagh ..... 38
Pressure Concrete Co. ..... 40
Revolvator Co. ..... 8
Cyrus Wm. Rice & Co., Inc. ..... 40
Robert and Company Associates ..... 36
Russell and Axon ..... 37
Sargent & Lundy ..... 36
Carl F. Schoenbaum ..... 38
Seelye Stevenson Value & Knecht .... 38
Singstad & Baillie ..... 38
Halwyn Smith ..... 36
Soiltest, Inc. ..... 7
Soil Testing Services, Inc. ..... 36
South Florida Test Service ..... 36
Sprague & Henwood, Inc. ..... 40
Stanley Engineering Company ..... 36
D. B. Steinman ..... 38
Sverdrup & Parcel, Inc. ..... 37
Syska & Hennessy, Inc. ..... 38
Tippetts-Abbett-McCarthy-Stratton ... 38
Toledo Testing Laboratory ..... 39
Turner Balances and Weights ..... 40
Emerson Venable ..... 40
Vogt, Ivers, Seaman & Associates .... 39
Water Service Laboratory, Inc. ..... 38
Whitman, Requardt and Associates .. 36
Wilson & Company ..... 36
Wight & Co. ..... 36

# What's New

**This column describes new products of general interest to professional engineers. For further information, circle the item number on opposite page and mail to the AMERICAN ENGINEER.**

***These listings are informational and are not an endorsement of the products, nor of the manufacturer's claims.***

## PORTABLE TRACING UNIT — Item 30



A larger-size portable tracing unit has been announced. Usable illuminated area is 35¾ x 47¼ inches, double any previous portable unit. Cool, yet bright, uniform lighting is provided by four 30-watt fluorescent lamps, and the Plexiglas top and rolled stainless steel frame give durability, minimize weight. A built-in straight edge and adjustable back legs make this a self-contained drafting unit.

## MECHANICAL CRAYON HOLDER — Item 31

Here is a newly designed, heavy-duty, push-button mechanical crayon holder that is rugged in construction and functional in design. The mechanical push-button is devised for one hand adjustment. The Mark I has a knurled finger grip and easy maneuverability. The manufacturer claims that the Mark I is exceptionally light in weight, but nevertheless strong and durable enough to outlast and outperform the other crayon holders on the market. It is economical in that it utilizes the crayon almost completely.

## "FLUSH CUT" SAW — Item 32

An electric reciprocating saw enables user to cut flush with any surface, in any position, performing operations heretofore regarded as impossible. Baseboards, quarter round quickly removed, bolts, pipes, rods, conduit, nails easily cut flush with surface, flush cut arm reversible for right or left hand cuts. It has an over-all length of sixteen inches.

## SPACE-SAVING FILE — Item 33

Plans to market a self-contained, vertical blueprint file, capable of holding 700 small blue prints up to 24" x 36" in size has been announced. Especially created for organizations with small-size print filing requirements, the "Glider" small print file will be constructed of heavy gauge steel, finished in durable, grey baked enamel and with outside dimensions of 24" x 24", will stand 48" from the floor. Seven print retainers will set in a heavy gauge steel track, easy to pull out.

## AUTOMATIC WHITEPRINTING MACHINE — Item 34

The Paragon-Revolute Corp. announces its newest machine for processing ammonia type diazo whiteprints, the Revolute Star. The Star offers production speeds up to 45 feet per minute with automatic separation. Front and rear suction tanks provide positive separation of original and sensitized material. It is constructed of cast aluminum.

## DRILLING MACHINE — Item 35

A small, lightweight, diamond drilling machine of exceptionally compact and portable design is being marketed. The unit consists of an extra heavy-duty drill motor operating at 1000 rpm and capable of clean, quiet, economical, high-speed drilling of holes up to five inches O.D. in all kinds of masonry materials including reinforced concrete.

## STUMBLE-PROOF DUCT — Item 36

Called "Electriduct," a new noiseless rubber duct for eliminating serious accidents caused by tripping on electrical wiring, small hoses, metal tubing, etc., lying on top of the floor has been designed for laboratories, workshops, factories and offices. It's stumble-proof and unobstructive and heavy equipment on caster rolls over easily. Being made of special rubber, "Electriduct" is noiseless to foot and caster traffic. It eliminates tangled messy extensions and hugs the floor inconspicuously.

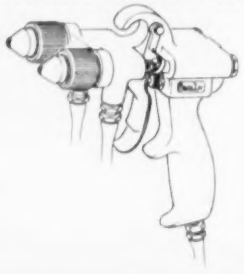
## HOT SPRAY UNIT — Item 37

The Spee-Flo Co. has introduced two new hot spray models. Completely self-contained, the Chieftain series combines the Spee-Flo hot spray heater and reciprocating pump in a portable unit which carries the original five or ten gallon paint container. It is especially designed for industrial and maintenance painting requirements where long hose lines and portability are required.

## MULTIPLE SLIDE RULE — Item 38

Greatly reducing computation time in the design of wire type electrical heating elements, the Calorel Multiple Slide Rule presents an entirely new approach to the determination and selection of various factors vital in the production of helix, flat sinuated, or return-band ribbon wire type heating elements. The Rule gives complete electrical heating answers with one setting. This revolutionary application of the multiple slide rule principle lends itself to further development of rules for the solution of other design engineering problems.

## PLASTIC SPRAY GUN — Item 39



Now in production is a unique dual-nozzled spray gun designed to spray plastic coatings and at the same time, eliminate premixing and storage problems. Using a dual-nozzled gun and internal mix caps, the resin and chemicals which must be combined to create a plastic coating, are mixed when they meet just in front of the surface to be sprayed.

# American Engineer

# Readers' Service Department

## Here's How Busy Engineers Can Keep Up-to-Date . . .

Registered, professional engineers *are* busy people but their careers demand that they "stay on top" regarding new products and new developments. We hope that our new READERS' SERVICE DEPARTMENT will help our more than 42,000 readers do just that.

### HOW WILL IT WORK?

It's easy. You will notice that each advertisement in this issue makes reference to a number used on the card below. If you want more information about any ad simply circle the corresponding number on the card and MAIL PROMPTLY! Read the ads in this issue NOW and then complete the card below and drop in the mail. The information you want will be on its way to you within a matter of days.

### TODAY'S TECHNOLOGY MOVES FAST—KEEP INFORMED

AMERICAN ENGINEER
2029 K Street, N.W.
Washington 6, D. C.

SEPTEMBER

Please have information sent to me on items circled below:

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |

Additional Remarks: .....

.....

My Name ..... Title .....

Company Name .....

Address .....

City ..... Zone ..... State .....

*Antique cars parade down Chicago's magnificent new concrete Congress Street Expressway.*

# "OUT OF THE MUD" or "OUT OF THE MUDDLE"

# You can depend on Concrete

*On Illinois Alt. 30 the motorcade moves from a 1955 road (rear) to a pavement built in 1919.*

*Near Geneva, the inner lanes of U.S. 30, built in 1918, are carrying ever-increasing traffic loads.*

Forty years ago America was pulling itself out of the mud. Today it is lifting itself out of a traffic muddle. Now, as then, concrete pavement is the dependable, *low-annual-cost* answer to the problem.

Illinois celebrated its first Good Roads Day in 1914. To commemorate the event a motorcade made a grueling 12-hour trip from Chicago to Sterling, Illinois, in flying gravel and choking dust.

Forty-two years later a motorcade of antique cars made the same trip, now possible in 3 hours, in the rain. Looking down on the new Congress Street Expressway, Chicagoans saw an amazing spectacle—ancient cars on the most modern of concrete highways.

Farther west, near Geneva, the old cars rolled over a four-lane section of U.S. 30, two lanes of which were built in 1918, two in 1931—all still giving good service at *low annual cost*.

Even better performance can be expected of the concrete pavements being built in the gigantic national highway construction program now under way. Today's smoother-riding concrete roads have a life expectancy of at least 50 years. Concrete serves far longer than any other pavement. It costs much less to maintain. And it is the safest pavement, wet or dry, night or day. Write for free illustrated booklet, distributed only in U.S. and Canada.

**PORTLAND CEMENT ASSOCIATION** Dept. 9-99, 33 West Grand Avenue, Chicago 10, Illinois

A national organization to improve and extend the uses of portland cement and concrete . . . through scientific research and engineering field work

*(Circle 10 on Reverse Cover)*